

ENVIRONMENTAL ASSESSMENT

***AFRL/MN LADAR RESEARCH LABORATORY CONSTRUCTION AND
ESTABLISHMENT OF AN OUTDOOR LADAR TEST RANGE,
EGLIN AIR FORCE BASE, FLORIDA***

RCS 99-162, 99-582, 03-375



***Prepared for
AIR FORCE RESEARCH LABS
MUNITIONS DIRECTORATE
EGLIN AIR FORCE BASE, FLORIDA***

***Prepared by
Tonya D. Savage
AFRL/MN ENVIRONMENTAL TEAM
EGLIN AIR FORCE BASE, FLORIDA***



13 August 2003

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 13 AUG 2003		2. REPORT TYPE		3. DATES COVERED 00-00-2003 to 00-00-2003	
4. TITLE AND SUBTITLE AFRL/MN LADAR Research Laboratory Construction and Establishment of an Outdoor LADAR Test Range Eglin Air Force Base, Florida				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Air Force Research Laboratory (AFRL/MN),Environmental Team,Eglin AFB,FL,32542				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 116	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

FINDING OF NO SIGNIFICANT IMPACT
FOR
AFRL/MN LADAR RESEARCH LABORATORY CONSTRUCTION AND
ESTABLISHMENT OF AN OUTDOOR TEST RANGE,
EGLIN AIR FORCE BASE, FLORIDA

RCS 99-162, 99-582, 03-375

Pursuant to the Council on Environmental Quality's regulations for implementing the procedural provisions of the National Environmental Policy Act (40 Code of Federal Regulations 1500-1508), Department of Defense Directive 6050.1, and 32 CFR 989 (Air Force Instruction 32-7061), the Department of the Air Force has conducted an Environmental Assessment (EA) of the probable environmental consequences for the construction of a LADAR research laboratory and establishment of an outdoor test range on Eglin Air Force Base (AFB), Florida.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

No Action Alternative:

The no action alternative would be to not transfer operations to Site C-1 or to construct an addition to Building 2067 at Site C-3. Safety issues and space constraints would remain.

Preferred Action Alternative:

The preferred action involves constructing a new 9,000 ft² LDERF (comprised of two buildings) in an undeveloped area currently used for recreation, which is west of TA C-53. The LDERF construction would create 25,270 ft² of impervious surface (building footprint, access road, parking lot, sidewalks, and concrete pad). The new buildings would contain an indoor LADAR range, laser characterization laboratories, office space, conference space, and storage space. The proposed action would also create a 117 acre LADAR test range, comprised of one, 1-km, 20-degree cone and one, 2-km, 10-degree cone.

Alternative 3:

This alternative involves constructing a 7,100-ft²-laser radar addition (area = 6,668 ft²) and observation tower (area = 432 ft²) adjacent to Building 2067, Site C-3, Auxiliary Field 2. The new laser radar building would consist of an indoor LADAR range, laboratories, office space, conference space, and storage space. An enclosed platform (tower room) on an adjacent 40-foot observation tower should facilitate all weather, outdoor testing and observation of laser radar seekers.

Alternative 4:

This alternative involves modifying the interior of Building 8777, Site C-1, to meet specifications for LADAR testing and to create office space for LADAR personnel. This

alternative also involves clearing a 40-acre, 15-degree cone-shaped range northwest of Building 8777, in order to establish an outdoor LADAR test range. This action would also involve constructing a small addition on the roof of the facility to allow for all-weather laser testing from an elevation other than ground level. A 40-ft. observation tower would also be constructed adjacent to the building.

Alternative 5:

This alternative involves reserving Site C-1 for potential transfer of its Laser Development and Evaluation Research Facility (LDERF) operations from Field 2 at Site C-3 to Building 8777 at Site C-1. The alternative also includes modifying the interior of the abandoned building to accommodate laser radar (LADAR) characterization laboratories, an indoor LADAR test areas, and office space for personnel. A 2,400-ft² indoor LADAR range will be constructed on the asphalt parking lot north of Building 8777. Finally, this alternative includes clearing approximately 72 acres of land in order to establish a northeast-bearing outdoor LADAR test range.

FINDING OF NO SIGNIFICANT IMPACT

After a review of the EA by the Air Armament Center, Environmental Impact Analysis Process Subcommittee, it has been concluded that the proposed construction of a LADAR research laboratory and establishment of an outdoor LADAR test range on Eglin AFB would not have a significant adverse impact of a long-term nature to the quality of the human or natural environment. Therefore, no Environmental Impact Statement will be prepared. This analysis fulfills the requirements of the National Environmental Policy Act, the President's Council on Environmental Quality and Air Force Instruction 32-7061.

25 Aug 03
DATE



JAMES D. SIRMANS, GM-15
Director, Environmental Management

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LIST OF ACRONYMS

ACM	Asbestos-Containing Material
AFB	Air Force Base
AFI	Air Force Instruction
AFRL/MN	Air Force Research Laboratory Munitions Directorate
AICUZ	Air Installation Compatible Use Zone
AOC	Area of Concern
AQCR	Air Quality Containment Region
AQUIS	Air Quality Utility Information System
AST	Aboveground Storage Tank
BISS	Base Installation Security Systems
BLS	Below Land Surface
BRA	Baseline Risk Assessment
BTU	British Thermal Units
CAA	Clean Air Act
CE	Civil Engineering
CFR	Code of Federal Regulations
dB	Decibel
dBp	Peak Decibel Level
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EOD	Explosive Ordnance Disposal
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FNAI	Florida Natural Areas Inventory
ft²	Square Feet
GIS	Geographic Information Systems
HAP	Hazardous Air Pollutants
HVAC	Heating, Ventilation, Air Conditioning system
IAP	Initial Accumulation Point
IPT	Integrated Product Team
IRP	Installation Restoration Program
LADAR	Laser Detection and Ranging
LBP	Lead-Based Paint
LDERF	Laser Development and Evaluation Research Facility
LUC	Land Use Constraints
m²	Square Meters
MNGS	AFRL/MN Guidance Division Seeker Branch
MSL	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NEW	Net Explosive Weight

LIST OF ACRONYMS (continued)

NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OAC	Outdoor Activity Committee
OI	Operating Instruction
OSHA	Occupational Safety and Health Administration
POL	Petroleum, Oils, and Lubricants
PPE	Personnel Protective Equipment
Ppm	parts per million
RCW	Red Cockaded Woodpecker
RD&E	Research, Development, Testing and Evaluation
RCRA	Resource, Conservation, and Recovery Act
RF	Radio Frequency
RFI	RCRA Facility Investigation
ROD	Record of Decision
RSO	Radiation Safety Officer
SIP	State Implementation Plan
TA	Test Area
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UXO	Unexploded Ordnance

1.0 PURPOSE AND NEED FOR ACTION

1.1 Proposed Action

The Air Force Research Laboratory Munitions Directorate (AFRL/MN) Seekers Branch (MNGS), the proponent, proposes to use an area west of Test Area (TA) C-53 to construct a Laser Development and Evaluation Research Facility (LDERF). This site would replace the facility and test range that currently exist on Field 2 at Site C-3, located on the Eglin Air Force Base (AFB) Reservation (Figure 1). Both the current and proposed LDERF sites are located off State Route 285; Range Road 200 (preferred location) is located 3.85 mi north of Highway 20, while Site C-3 is located 4.9 mi north of Highway 20. The preferred action location is 0.55 mi east of State Route 285, 0.95 mi west of Site C-53, and is directly south of Range Road 200 (Figure 2). This preferred location is currently an undeveloped, forested area. The preferred action is to construct two, 4,500 ft² buildings that will house laser detection and ranging (LADAR) characterization laboratories, an indoor LADAR test range, storage space, and office space/conference space for personnel. The preferred action also includes clearing approximately 117 acres of land in order to establish an outdoor LADAR test range. The specific objectives of this project are to:

- * Restore LADAR facility mission currently limited by Base Installation Security System (BISS) activities
- * Provide a safer working environment for personnel (who currently have workstations adjacent to eye-hazard lasers) by creating separate areas for personnel and laser characterization activities
- * Increase space to accommodate simultaneous operation and integration of multiple laser systems
- * Provide ample space for machining processes that will not disrupt normal office activities
- * Provide adequate workspace for new scientists and engineers designated to the LADAR activity
- * Be capable of generating LADAR data during inclement weather conditions (Gorski 2003)

All objectives are imperative to restoring, sustaining, and enhancing the mission of the LDERF. After 11 September 2001, BISS activity at Site C-3 dramatically increased, further limiting the ability of the LDERF to conduct outdoor LADAR test missions. In 2002, 46 TW personnel informed LDERF personnel that three igloos would be constructed in the path of the current outdoor LADAR range and a new site would need to be established for LDERF operations.

1.2 Related Environmental Assessments

There are no environmental assessments relating to this proposed action.

1.3 Relevant Environmental Issues

Per the National Environmental Policy Act (NEPA) and 32 CFR 989 (Air Force Instruction (AFI) 32-7061), issues were scoped by the EIAP 813 Working Group. Potential impacts to

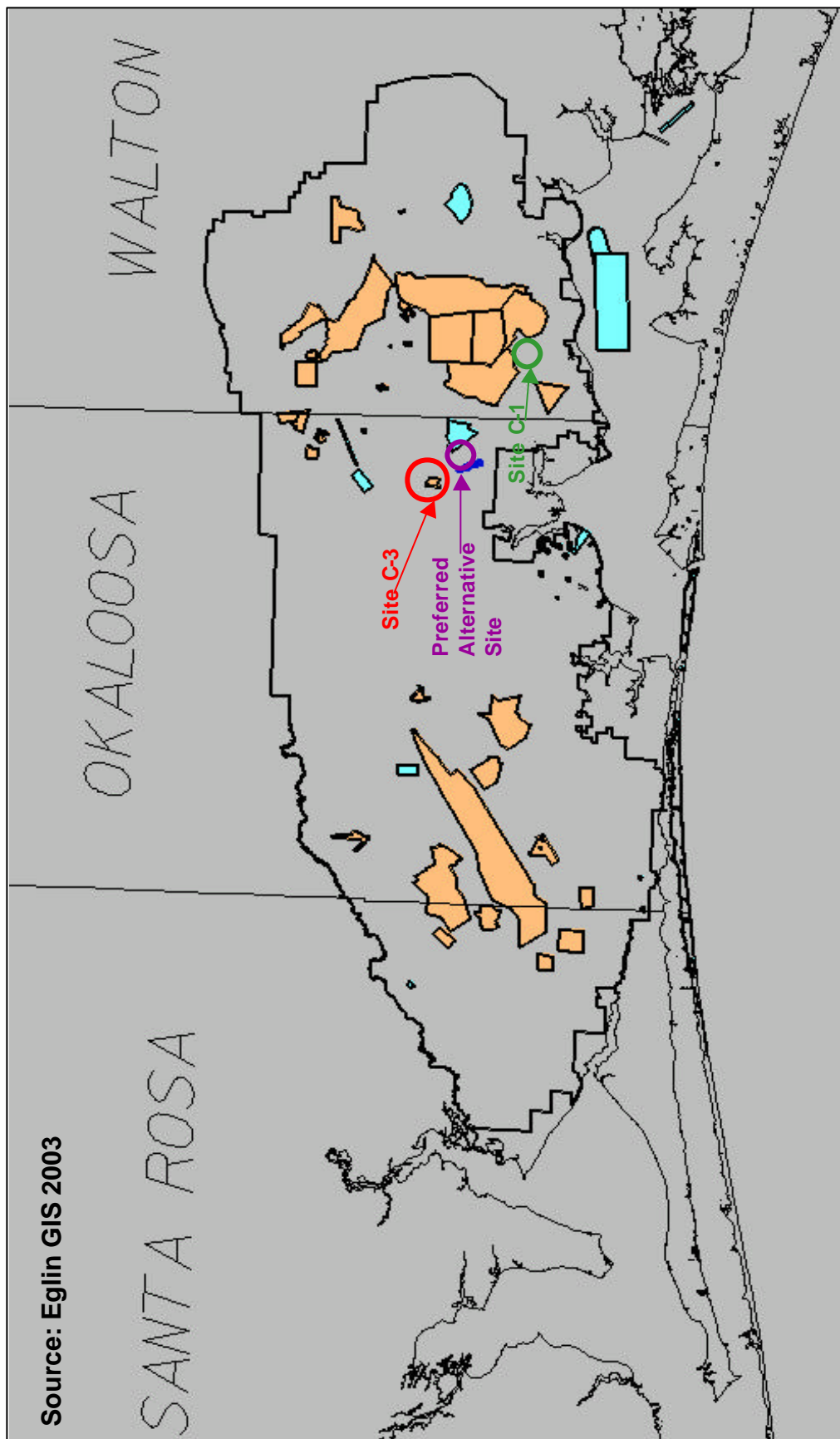


Figure 1. Location of Eglin Air Force Base, Florida

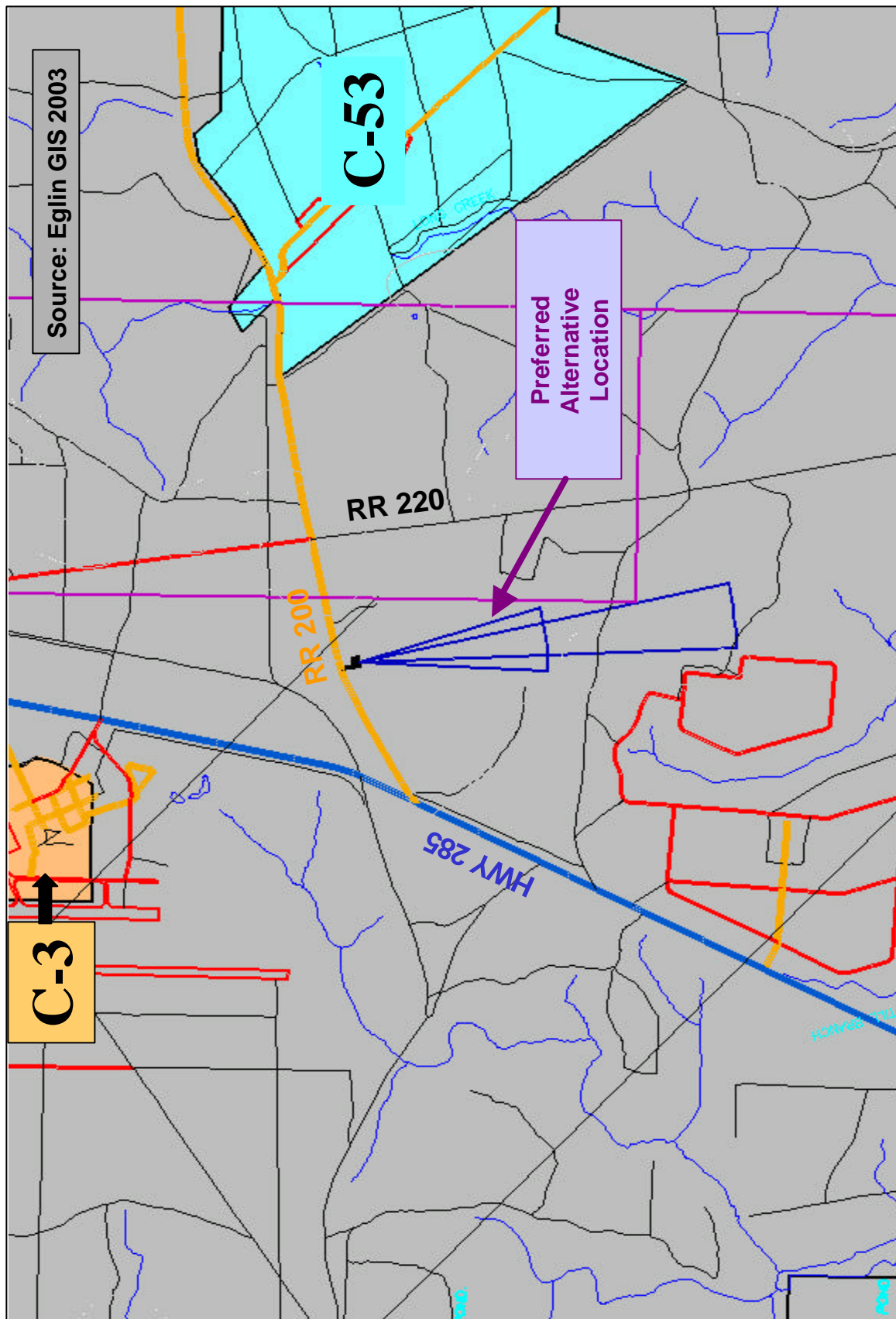


Figure 2. Location of Preferred Alternative Site Relative to Site C-3 and Test Area C-53

AICUZ/land use, air quality, water resources, safety and occupational health, hazardous materials and waste, biological resources, socioeconomic, and environmental justice were identified. In addition, noise impacts from TA C-52 on the proposed LDERF mission at Site C-1 were also cited as a potential impact. Potential impacts to cultural resources and soils were also considered.

1.4 Permitting Requirements

The proposed action would not require federal permits, licenses, or entitlements for its implementation.

If any state and local permits were needed for the proposed action, they would be obtained as necessary.

1.5 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, requires federal agencies to identify community issues of concern during the NEPA process, particularly those issues relating to decisions that may have an impact on low-income or minority populations. Environmental Justice has been considered and, in this case, determined to be inapplicable.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This Environmental Assessment (EA) addresses the possible environmental impacts of 5 alternatives, including one proposal for the establishment of an outdoor LADAR range at a preferred site (west of TA C-53), two proposals for different range schemes at the same alternative site (Site C-1), and the construction of an administrative addition at the current site (Site C-3). A “No Action” alternative is also considered. In addition to describing the five alternatives considered, this chapter also includes a brief summary of each alternative’s environmental consequences. The 46th TW RDESC selected the preferred site for the proposed action and the alternatives that were considered but eliminated from further review.

2.1 Alternative 1—No Action Alternative

This “No Action” alternative would not relocate LDERF operations to an area west of TA C-53, would not establish a 117-acre LADAR test range, nor would it add a potential administrative addition to Building 2067, Site C-3. If the “No Action” alternative were chosen, the AFRL/MN LDERF would have no capability to safely and efficiently meet the future development and test requirements of LADAR seekers. As new engineers and scientists are hired to facilitate increasing research, development, testing, and engineering (RDT&E) requirements, overcrowding of the laboratory spaces will continue. Scientists would still be forced to have personal workstations in active laser characterization laboratories. The result of no action would be a LDERF that would no longer be capable of accomplishing required LADAR integration and characterization tests.

2.2 Alternative 2—Construct a New LDERF and Establish an Outdoor LADAR Range West of Test Area C-53 (Preferred Alternative)

Alternative 2, the preferred alternative, involves constructing two, 4,500 ft² buildings located adjacent to each other (Figure 3). The proposed action would also involve establishing a 117-acre LADAR test range that would contain one 1-km, 20-degree cone and one 2-km, 10-degree cone (Figure 4). The cone would bear south/south east from the proposed LDERF to allow for LADAR test equipment to be used for lasing on the range of up to five times a week. Finally, an access road from Range Road 200 and a parking lot would also be established at the site.

Construction of LDERF Facilities, Access Road, Parking Lot, and Concrete Pad

The single story administrative building would be similar to the existing building at Site C-3. The building would rest on a concrete slab and have a steel beam frame. The first building, the research facility, would house the laser characterization laboratory, detector laboratory, a 21 ft. by 100 ft. indoor laser range, and equipment storage. An enclosed laser lab would be equipped with exterior warning lights to indicate when lasers were in use. This south side of the building would have garage door-style doors that would rise to allow for LADAR equipment to send and receive laser signals to and from targets on the outdoor range. The second building would contain office space, conference space, a machine shop, electronics shop, and storage.

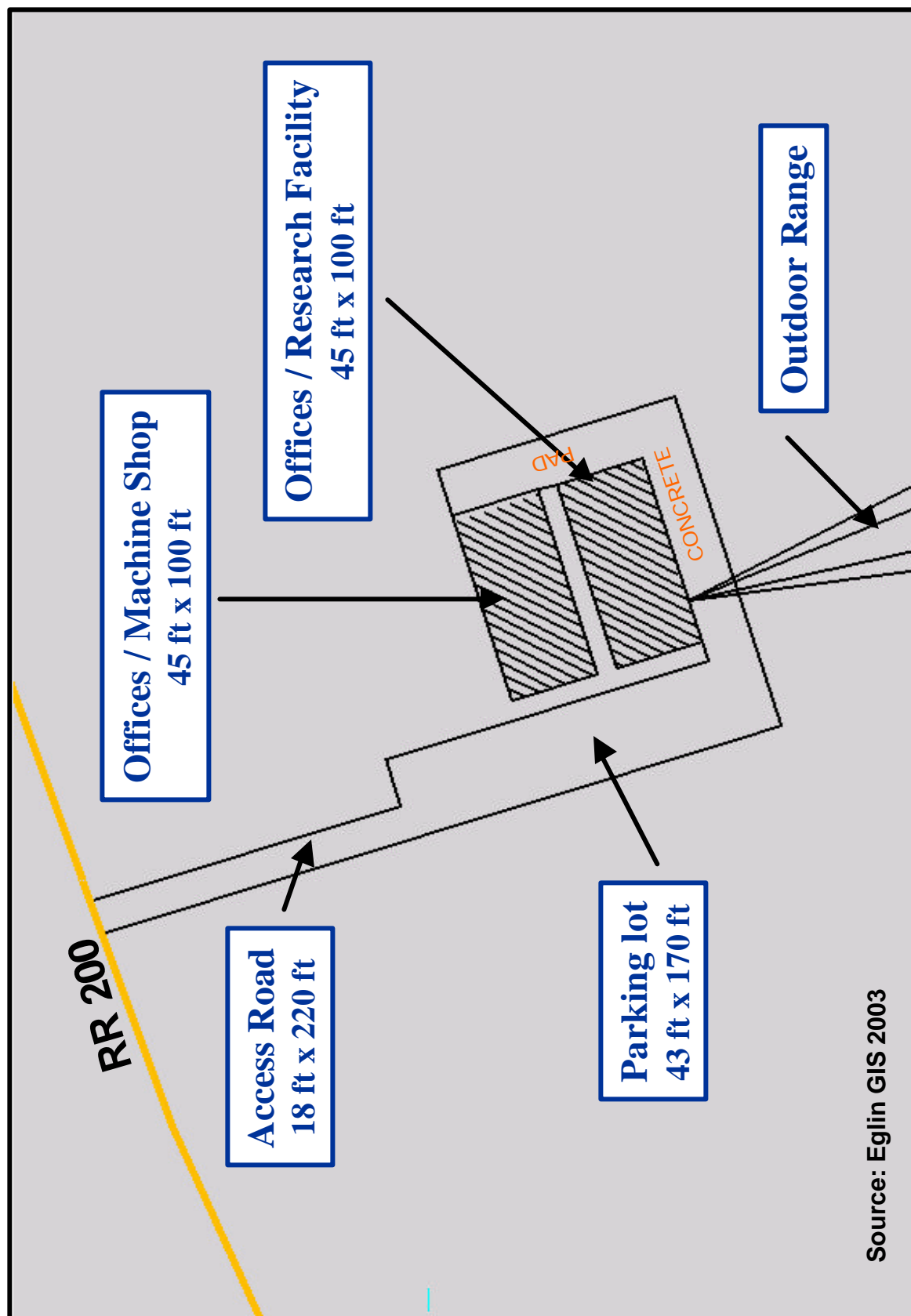
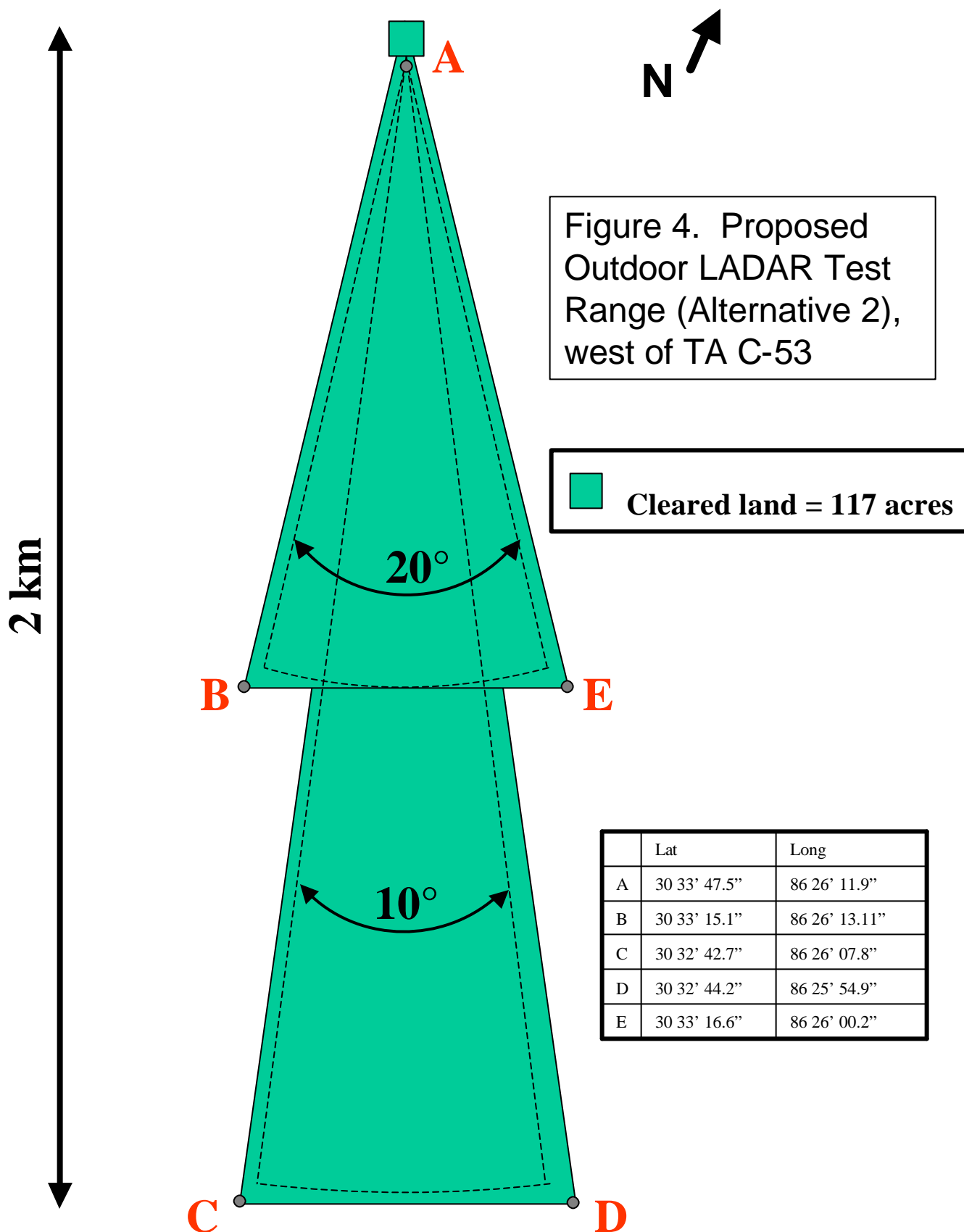


Figure 3. New LDERF Site Detail (Under Preferred Action)



The small number of hazardous materials used at the site would remain segregated, secured, and monitored (as currently practiced).

This alternative would create 9,000 ft² of impervious surface for building construction. An access road and parking lot would need to be established and paved. The access road would have a gate at the entrance (as an extra security measure) to prevent vehicle trespassing on the site. The road would extend 220 feet south of Range Road 200 and would be wide enough for one automobile in one direction (18 feet). The access road would terminate at a parking lot, located on the north side of the office and lab buildings. Trees will not be cleared on either side of the access road to help obscure the location of the site. The parking lot would also be paved and would accommodate space for twenty cars (site personnel and visitor parking). The access road would create roughly 3,960 ft² of impervious surface, while the parking lot would create roughly 7,310 ft² of impervious surface.

Finally, a paved pad will be added around the side of the research facility (Figure 3) to allow for equipment and material delivery. This paved area will be approximately 5,000 ft². The total amount of impervious surface would be roughly 25,270 ft². The proponent will coordinate with AAC/EMC and 96 CEG to ensure that proper storm water management structures are addressed with the design of the building.

Establishment of an Outdoor LADAR Test Range

The proposed action also involves creating a south/southeast-bearing outdoor LADAR test range (Figure 4). The range will be divided into 1-km and 2-km-length cones. The first cone will extend 1 km southeast from the new LDERF facility and will have a 20-degree cone angle. The second cone will fall within the first cone, but will be 2 km in length with a 10-degree cone angle. The approximate area to be cleared is 117 acres of rangeland. This will include a 20-foot safety line-of-sight buffer around the perimeter of the LADAR range. The geographic coordinates of the proposed cones are:

	<u>Latitude</u>	<u>Longitude</u>
Apex of cones:	30 33' 47.5"	86 26' 11.9"
SW point of 20° cone	30 33' 15.1"	86 26' 13.11"
SE point of 20° cone	30 33' 16.6"	86 26' 00.2"
SW point of 10° cone	30 32' 42.7"	86 26' 07.8"
SE point of 10° cone	30 32' 44.2"	86 25' 54.9"

A clear line of site will need to be established and maintained for paneled targets set along the length of the range. Although the area is a sparsely forested corridor of land, the remaining trees will need to be clear-cut. Any disturbed areas would be seeded with grass or vegetated by some other means to anchor the soil. Also, the planting effort would be maintained to prevent further erosion from occurring. This area may be treated with an herbicide to prevent the propagation of noxious weeds. Since scheduling conflicts with the BISS operations at Site C-3 would be eliminated, the LDERF facility would have near unlimited access to conduct realistic outdoor testing, which could be up to 5 times per week.

2.3 Alternative 3—Construct Addition to Current LADAR Facility, Site C-3

The third alternative is to construct a 7,100-ft² LDERF addition (area = 6,668 ft²) and observation tower (area = 432 ft²) adjacent to Building 2067, Site C-3, Auxiliary Field 2. The new LDERF addition would consist of an indoor LADAR range, laboratories, office space, conference space, and storage space. An enclosed platform (tower room) on an adjacent 40-foot observation tower should facilitate all weather, outdoor testing and observation of laser radar seekers.

This alternative would create 7,100 ft² of impervious surface. However, an impervious remnant of an abandoned runway currently exists at the location of the proposed construction. Thus, there would be a minimal amount of net additional impervious surface created. In addition to existing portions of an abandoned runway, the building site is a cleared range area covered with native grasses. Because of scheduling conflicts with the BISS operations at Site C-3 expected by the 46 TW, the LDERF facility would not be able to increase the number of LADAR tests. Presently, all operations have ceased on the 700-meter test laser range at Site C-3. A temporary LADAR range has been established on this site under an agreement with the BISS with the expressed condition that it will serve as a provisional operating area only. Long-term use of this temporary range site would have similar mission conflicts as the current C-3 site. The temporary range has been used once for an operational test since it was established in 2002.

2.4 Alternative 4—Modify Bldg. 8777 and Establish Range, Site C-1

This action involves modifying the interior of Building 8777, Site C-1, which is located south of the TA C-52 complex (Figure 5). The proposed action also involves establishing a 40-acre, 15-degree outdoor LADAR test range bearing northwest of Building 8777 (Figure 6). This action would also involve constructing a small addition on the roof of the facility to allow for all-weather laser testing from an elevation other than ground level. A 40-ft. observation tower would also be constructed adjacent to the building.

Interior Modifications

Building 8777 is a 13,264-ft² facility constructed in two phases. The first phase, 9,757-ft² was constructed in 1957; the second phase, 3507 ft², was constructed in 1971 (Figure 7). The extra square footage was added to Building 8777 when its classification was changed from a Biological Sciences Laboratory to an Electronics Research Radar Laboratory. The building is comprised of one usable floor and a partial balcony. The foundation and floor of the building are reinforced concrete, with concrete walls and a five-ply built-up roof. The building is heated by two, 1,000-gallon diesel tanks, which feed boilers that provide comfort heat and hot water for the building (U.S. Air Force 1999a).

In order to bring Building 8777 up to occupancy standards, certain interior modifications need to be made. Building 8777 is currently being used as a storage building for materials, equipment, and documents belonging to the 46 TW. These items are left over from past missions at Site C-1. Although the building is in very good condition, repairs must be made to damaged ceiling tiles, floor tiles, and wall sections. Some damaged ceiling tiles were noted on the first floor, in

the balcony, and in the main heating, ventilation, and air conditioning (HVAC) room. Since non-friable asbestos is located around pipes in the HVAC room, the area must be contained and ceiling tiles replaced without damaging the asbestos and rendering it friable. Since asbestos was also detected under the floor tiles, the floor tiles may also be removed. However, the flooring is in very good condition, so it may be feasible to simply cover over the tiles with an additional layer of flooring. This would prevent the delays and costs associated with the containment and removal of the asbestos-containing material (ACM) (Kirksey 1999).

Lead based paint (LBP) was also identified in Building 8777. Any chipped LBP found in Building 8777 would be removed and disposed of according to the AAC *Lead Based Paint Plan*, AAC Plan 32-4 (U.S. Air Force 2002a). Areas where the walls are not damaged would be encapsulated with non-LBP or paneling. All activities involving ACM and LBP would be coordinated with the Bioenvironmental Engineering Flight. Some partition walls (comprised of sheet rock and studs) may be removed in the split-level area to re-open the balcony. This should not disrupt any ACM (Rackard 1999).

Construction of 2nd Floor Observation Room and Tower

The proposed action also involves constructing an observation deck on the roof of Building 8777. This addition would not extend the footprint of the facility. The structure would be a 2,400-ft² metal frame building with one roll up door to allow for testing lasers from a 20-ft. height to downrange targets. A 40-ft observation tower may also be constructed on the west site of Building 8777 and would be placed directly against the building. This placement would ensure easier access to the tower. The observation tower may cover a 2,500-ft² section of the paved parking lot (Rackard 1999).

Establishment of a Northwest-Bearing Outdoor LADAR Test Range

The proposed action also involves creating a northwest-bearing outdoor LADAR test range (Figure 8). The range should be 1,000 meters in length, and have a 15-degree cone with the apex at Building 8777. The range should cover roughly 40 acres of rangeland. The geographic coordinates of the proposed cone are:

	<u>Latitude</u>	<u>Longitude</u>
Apex of Cone:	30' 31" 3.439675	86' 20" 14.24847
SW Pt. of Cone:	30' 31" 2.433770	86' 20" 48.07766
NE Pt. of Cone:	30' 31" 10.26264	86' 20" 44.89554

As with Alternative 2, a clear line of site will need to be established and maintained for targets set along the range. Since this area is currently forested, 40 acres of trees would need to be clear-cut for this purpose.

Due to an existing parking lot, no impervious parking lot surfaces would be created. Since 46 TW-expected scheduling conflicts between LDERF and BISS would be eliminated, current resources would be able to support up to 5 LADAR tests per week (Gorski 2003). However, there is a potential for LADAR test schedules for Alternatives 4 and 5 to conflict with tests

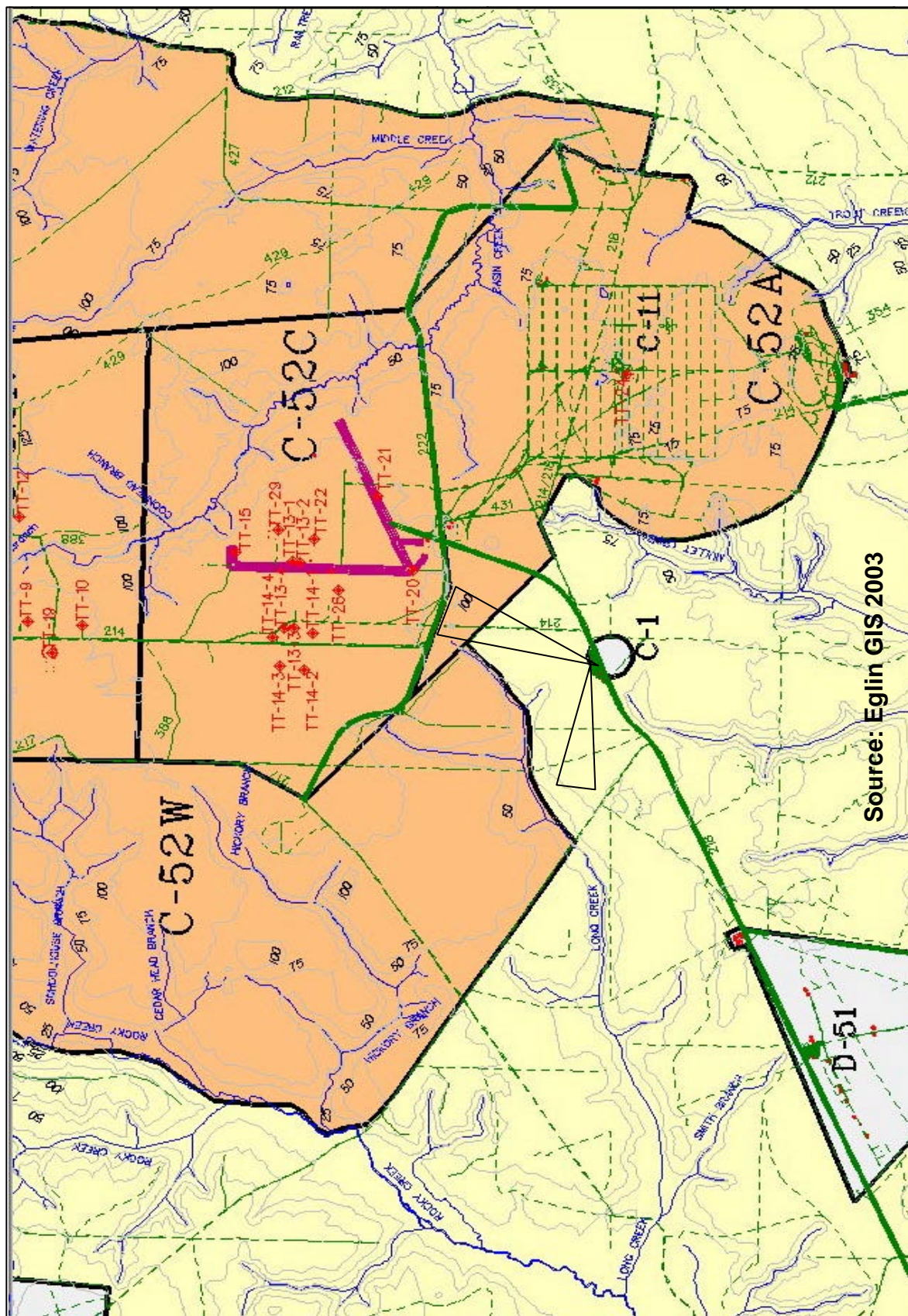


Figure 5. Location of Site C-1 in relation to TA C-52 Complex

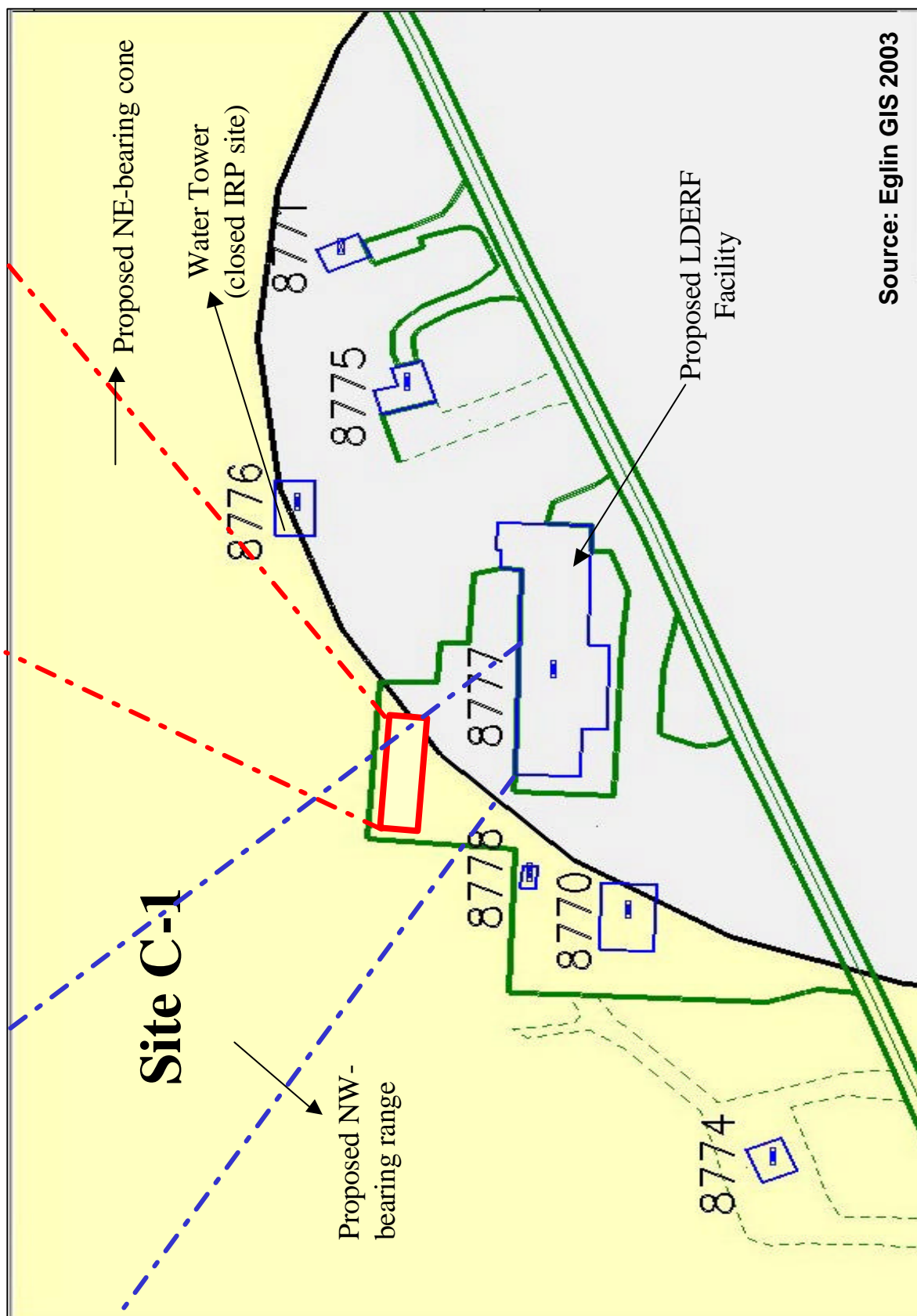
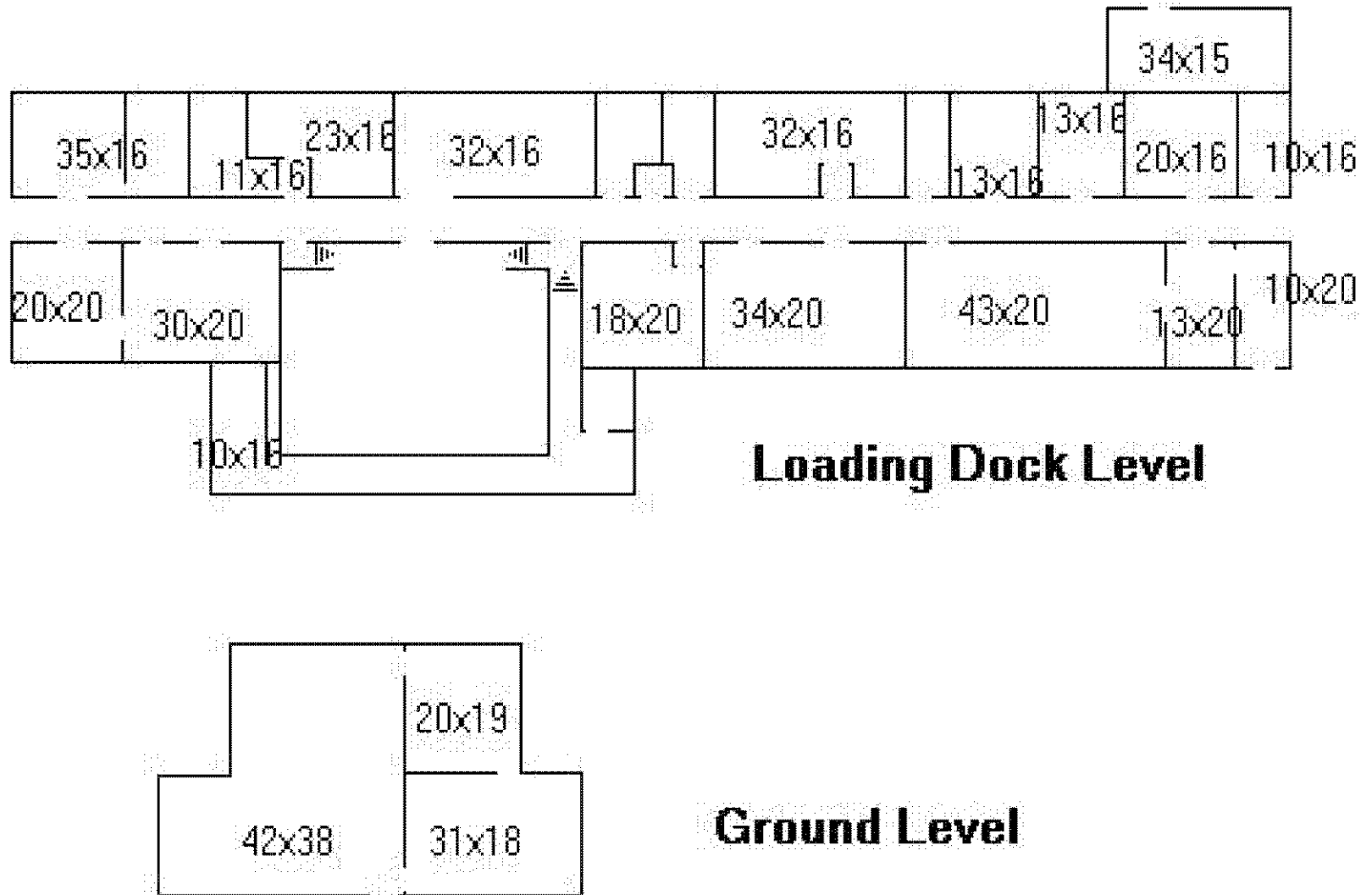


Figure 6. C-1 Site Detail



Source: Smith 2000

Figure 7. Diagram of Building 8777, Site C-1

performed at TA C-52. According to Range Scheduling, 46 OSS, historical evacuation of Site C-1 averaged 1-2 times a year (Miller 2000). However, due to the increased activity of the U.S. Navy COM2EX and JTFEX training missions that will take place at Eglin AFB twice a year, there is a potential for increased scheduling conflicts. This will be discussed in more detail in Chapter 4 under “Mission Conflicts” for Alternatives 4 and 5.

2.5 Alternative 5—Modify Building 8777, Construct Indoor Laser Range, and Establish Outdoor Range, Site C-1

This action involves modifying the interior of Building 8777 as described in Alternative 4, which would create laboratory and office space for LADAR personnel. This action also involves constructing a 2,400-ft² indoor laser range, which would be located directly north of Building 8777. This building would provide indoor laser testing capabilities that could not be accommodated in Building 8777, due to the fact that a long, continuous space would be needed to test certain laser systems. Currently, the only space in Building 8777 that could accommodate this requirement is a long hallway that bisects the building. However, due to safety reasons, this idea would be unacceptable. Finally, this action proposes to establish a 72-acre, 15-degree, northwest-bearing outdoor laser range. The apex of this range would be at the proposed indoor laser range, and the cone would extend 1,500 m bearing northeast.

Interior Modifications

Interior modifications under this alternative would take place exactly as described under “Interior Modifications,” Alternative 4, Section 2.4.

Construction of an Indoor LADAR Range

This action proposes to create a single-story, stand-alone facility, which would contain an indoor LADAR testing range (Figure 9). This 80 foot by 30 foot building would be constructed on the existing asphalt parking area directly north of Building 8777. By placing the addition in this location, the footprint of the site would remain the same and no new net impervious surface would be created. The structure would be constructed of either cinder-block walls, other concrete masonry units (CMU), or a metal frame covered by metal sheeting (similar to the buildings that currently exist at Site C-3) (Rackard 2000). The building would have 4 roll-up doors facing north, which would allow for laser systems to be tested down range, bearing northeast. The interior of the building would consist of 4 internal bays, divided by partitions and 10 feet by 80-ft indoor LADAR range. Placing the indoor laser range north of Building 8777 would eliminate the water tower obstruction, which would prevent laser testing in the northeast direction from Building 8777 (Smith 2000).

Establishment of a Northeast-Bearing Outdoor LADAR Range

This action also involves creating an outdoor LADAR range. Although this range will be a 15-degree cone like the range in Alternative 4, the range under Alternative 5 will be 500 meters longer and the area roughly twice as large. The apex of the range would be located at the proposed indoor LADAR range, and would extend 1,500 meters bearing northeast towards TA

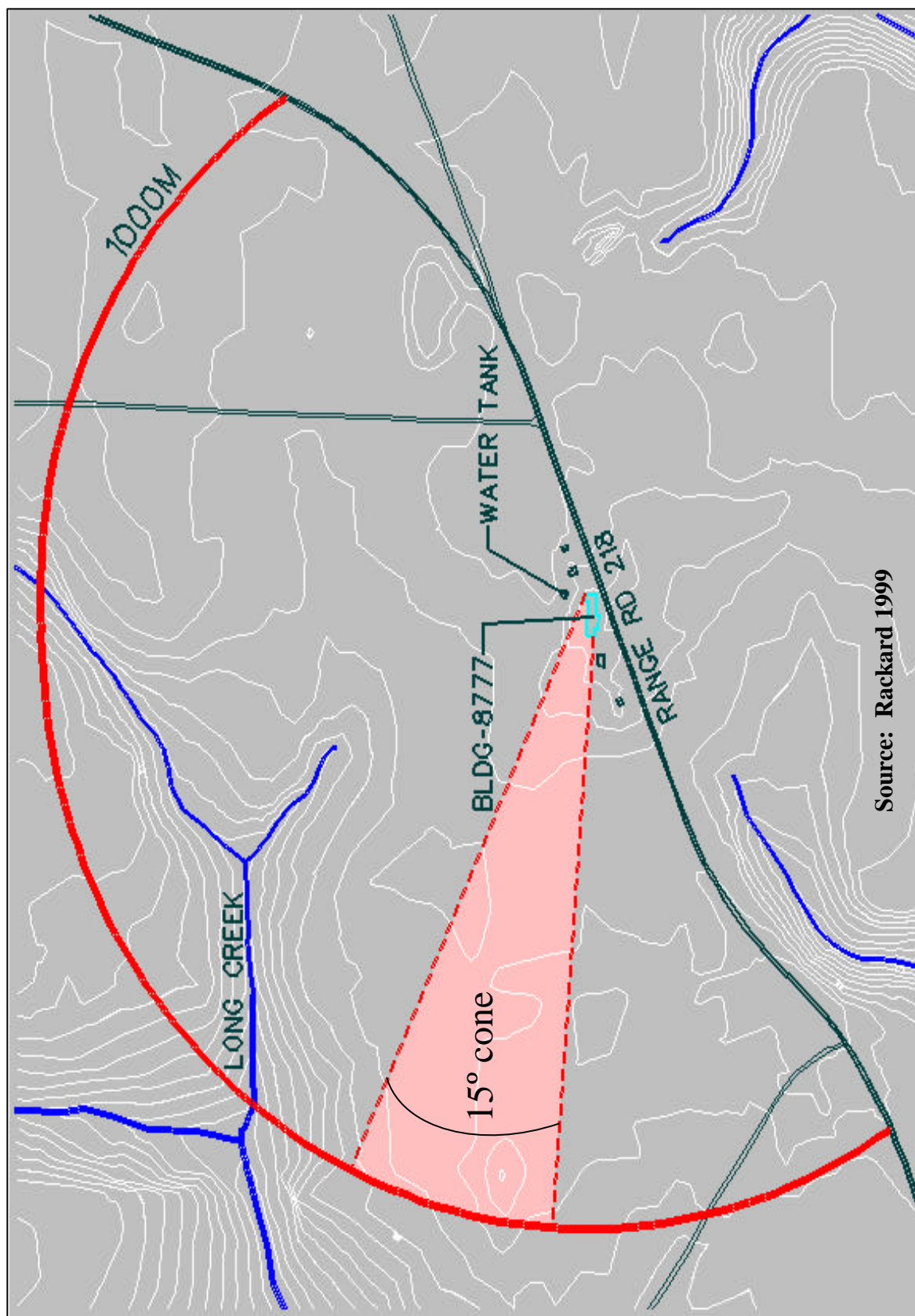


Figure 8. Proposed Outdoor LADAR Test Range (Alternative 4), Site C-1

C-52 C (Figure 10). The geographic coordinates of the proposed cone are:

	<u>Latitude</u>	<u>Longitude</u>
Apex of cone:	30°31' 04.1471	86°20' 13.5146
NW Point:	30°31' 51.7730	86°19' 51.1103
NE Point:	30°31' 46.2190	86°19' 36.7075

As with Alternative 4, it is necessary to maintain a clear line of sight for targets set along the range. Thus, roughly 72 acres of sand pine, longleaf pine, and scrub oak will be cleared. A contractor would pay Jackson Guard to clear sand pine and long leaf pine, which would be removed by selective clear cutting. The contractor would only remove the usable, merchantable timber. Either Civil Engineering or a contractor would clear the woody (live oaks) and herbaceous understory (Ironside 2000). Due to unexploded ordnance (UXO) concerns, stumps would not be removed; trees should be cut flush to the ground. Normally CE or a contractor would also re-grade the site, but the likely presence of UXO would make that action infeasible.

2.6 Description of Alternatives Considered but Eliminated from Detailed Study

The alternatives presented represent a reasonable range of alternatives. The two main considerations in determining whether an alternative should be considered were mission feasibility, potential for mission conflict, and environmental considerations. It was preferred to relocate the LDERF to a site that would allow for the construction of specialized research space in an isolated area that would not be subject to frequent mission conflicts. The proponents of the action wished to keep environmental impacts at a minimum. Three alternatives were considered but eliminated due to their failure to meet the basic qualitative criteria set by LDERF administration and the 46 TW. The eliminated alternatives and the reasons for elimination are provided below.

2.6.1 Site C-11

This site is a 1-mile test grid located on Range C-52 A, IRP Site SS-25. The alternative of constructing a new LDERF facility at C-11 was discarded due to Installation Restoration Program/U.S. Environmental Protection Agency/Florida Department of Environmental Protection (IRP/USEPA/FDEP) land use constraints (LUC) imposed on the site. A RCRA Facility Investigation/Baseline Risk Assessment (RFI/BRA) was conducted at this site and concluded that the herbicide/defoliant test operations formerly conducted at these sites have had no negative effect on human health and the environment. However, future land usage was a concern. The LUCs restrict future development of the sites for residential use and the use of shallow aquifer for potable purposes. There are no restrictions on commercial/industrial development or on the use of the Floridan Aquifer for potable usage purposes. This remedy should protect human health and the environment for perpetuity (Eglin AFB 1998). Ultimately, the future development or use of this site cannot be predicted, and thus no type of use should be eliminated.

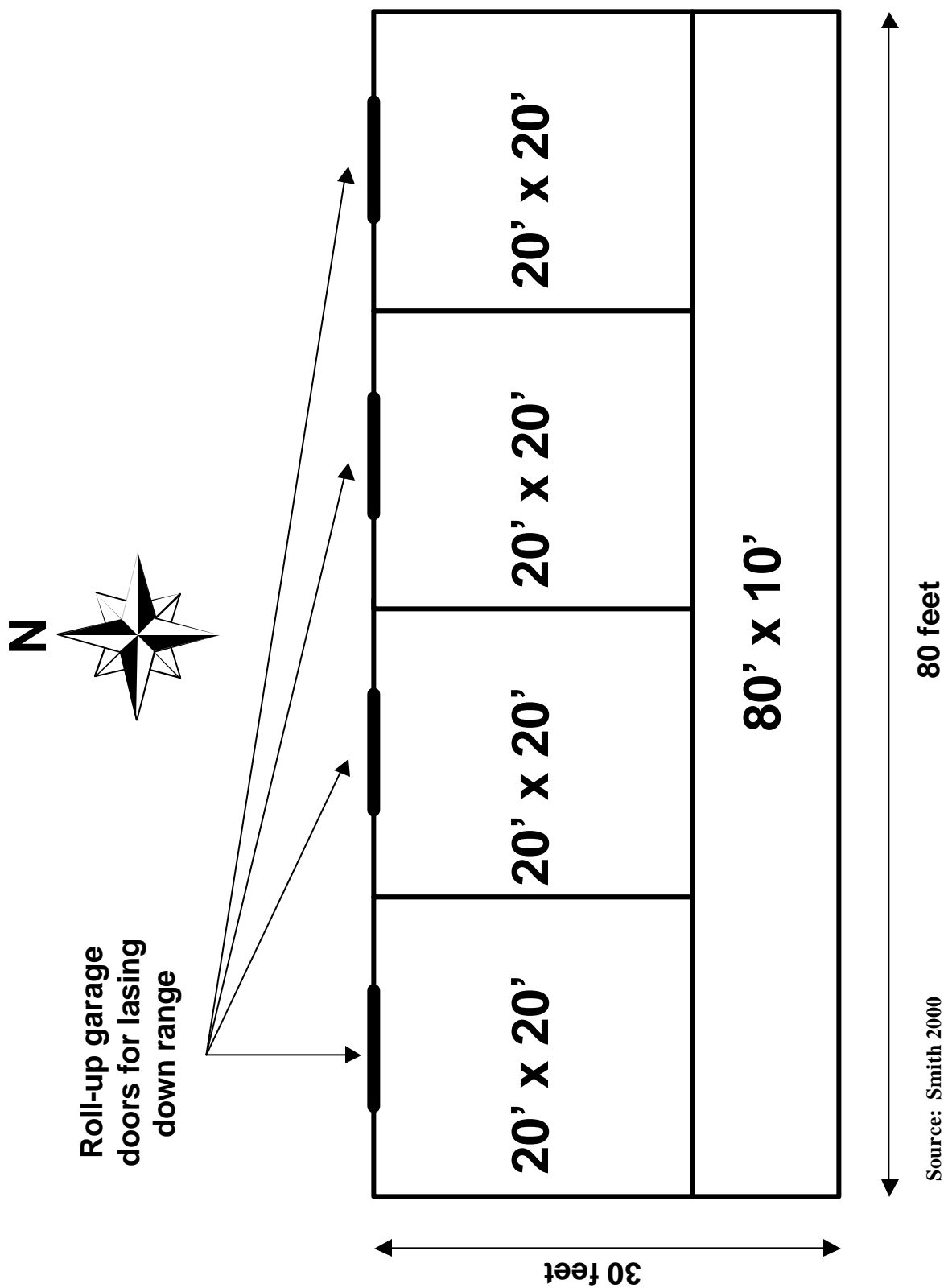


Figure 9. Proposed Indoor LADAR Test Range (Alternative 4), Site C-1

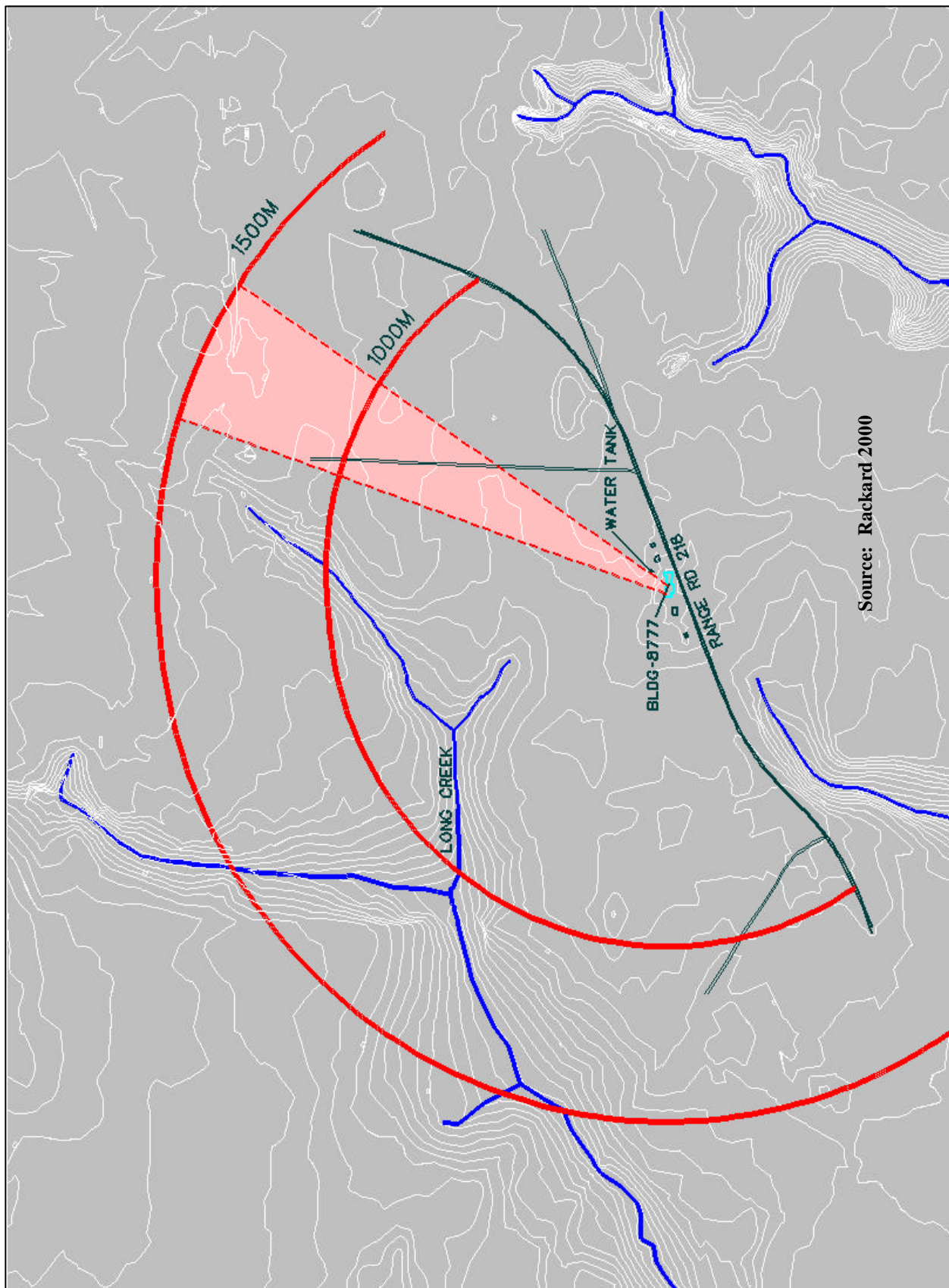


Figure 10. Proposed Outdoor LADAR Test Range (Alternative 5), Site C-1

2.6.2 Site C-64 (North of Range)

Site C-64 is located west of State Route 285 on Range Road 416. The alternative of constructing a new LDERF facility at this site was discarded due to environmental concerns, and scheduling conflicts with current range missions. There are severe erosion problems north of the range that could affect Titi Swamp should further construction occur. Other environmental concerns include possible depleted uranium munitions residue, cultural resources concerns, endangered species issues, and wetlands concerns associated with this area (Bristol 1999).

2.6.3 Test Area C-53 (within test area boundaries)

TA C-53 is located east of State Route 285 on Range Road 200. The alternative of constructing a new LDERF facility at this site was discarded due to environmental concerns and potential future mission conflicts. Environmental concerns include endangered species issues (presence of Red Cockaded Woodpecker (RCW) cavity trees and proximity to Okaloosa Darter streams), wetlands concerns, and cultural resources concerns (Bristol 1999).

2.7 Comparison of Alternatives

The five alternatives considered in this assessment were compared by how the implementation of each action would affect various environmental parameters. Table 2.1 is a summary matrix of potential environmental impacts. These environmental parameters include: biological resources, water resources (flood plains, groundwater, surface water, wetlands), geology and soils, hazardous materials/hazardous waste, cultural resources, safety, noise, air quality, socioeconomics, aesthetics, and land use designation. If a possible impact to a parameter was anticipated, the impact is described below. Minimal to no impacts are listed as “no impact.”

Table 2.1 indicates no adverse environmental impacts for the “no action” alternative. The second (and preferred action alternative) is to construct a LDERF and establish an outdoor LADAR range west of TA C-53. This alternative would create 25,270 ft² of impervious surface, which would trigger the implementation of storm water management regulations. One hundred seventeen acres of trees, though sparsely forested, would be cut. This would eliminate a potential long leaf pine restoration area and this area would no longer be available to RCW to establish cavity trees or foraging area.

There would be soil disturbance in the area around the LDERF due to site grading, but this would be very localized. There may be some soil disturbance when the area is cut due to the movement of heavy vehicles cutting trees and transporting them out of the area. This area is in the outer boundary of a zone of high probability for encountering either surface or subsurface UXO. A thorough UXO sweep would need to be conducted before any clear-cutting or construction activities could occur.

Due to the establishment of an outdoor LADAR test range, up to 785 acres of land would become restricted area (LADAR range plus safety footprint) that could not be used for recreation (Johnson 2003). The preferred action location falls within Management Area #10, which is primarily used for general hunting, dog hunting, archery, and small game hunting.

There is a potential that Hellfire missions at TA C-72 could cause the LDERF to be evacuated at certain times throughout the year. Finally, there will be a change in land use, converting a forested area used for recreation into a test facility and test range. There should be no impacts to hazardous materials/hazardous waste, cultural resources, noise levels, or air quality.

The third alternative, constructing an addition to Building 2067 at Site C-3, would create 7,100 ft² of impervious surface. Perceived range scheduling conflicts with BISS is a concern. Given the degraded environment at C-3, there are no other projected adverse environmental impacts. Out of the 4 “action” alternatives, this alternative would cause the least environmental impacts.

The relocation of the LDERF to Site C-1 (Alternative 4) would have some potential for impacts to the environment and safety. Forty acres of forested area would be cleared in order to establish an outdoor laser range. This would eliminate habitat for several species, which would be forced to live and forage in another area. Hazardous materials/hazardous wastes issues exist, due to the detection of LBP and ACM in the building. Socioeconomic concerns involve the relocation of personnel to a site farther away from the current work location. Mission down time during relocation is also a cost that must be considered.

The most pressing concern with the proposed action is the UXO hazards on the range. Due to the suspected high contamination of UXO in this area, a thorough UXO sweep would need to be conducted before work could be performed on the range. Also, range clearing and re-grading activities would be limited, due to the potential to detonate subsurface UXO. Another safety concern includes evacuating site personnel during ordnance tests on TA C-52, and the mission down time associated with such evacuations.

The fifth alternative, the construction of an indoor LADAR laboratory and establishment of an outdoor LADAR test range, would have greater potential for impacts to the environment and safety. Seventy-two acres of forested area would be cleared in order to establish this outdoor range. This would eliminate habitat for several species, which would be forced to live and forage in other areas on the reservation. In addition, several new-growth and old growth long leaf pine stands were found east of Range Road 214, which bisects the proposed range. Cutting down these trees would remove an area that could potentially serve as future habitat for RCW. Although stumps will not be removed during the range clearing process, soil will be disturbed due to the presence of heavy machinery used for clear-cutting. Since the northern line of the range falls roughly 300 meters from a steep down slope to Long Creek, there is a potential for disturbed soil to flow down to the Okaloosa Darter stream.

Hazardous materials/hazardous waste issues exist, due to the presence of LBP and ACM in Building 8777. Socioeconomic concerns involve the relocation of personnel to a work site farther away. Mission down time during relocation is also a cost that must be considered.

The most pressing concern with the proposed action is the UXO hazard on the range. Due to the suspected high contamination of UXO in this area, a thorough UXO sweep would need to be conducted before work could be performed on the range. Also, range clearing and re-grading activities would be limited, due to the potential to detonate subsurface UXO. Another safety

concern includes evacuating site personnel during ordnance tests on TA C-52, and the mission down time associated with such evacuations.

2.8 Preferred Alternative

The preferred mission alternative is Alternative 2, the construction of a new LDERF and establishment of an outdoor LADAR range west of Test Area C-53.

Table 2.1 Summary Matrix of Potential Environmental Impacts

Affected Parameter	Alternative 1 No Action	Alternative 2 (W of C-53) <u>Preferred</u>	Alternative 3 (Site C-3)	Alternative 4 (40 ac range) (Site C-1)	Alternative 5 (72 ac range) (Site C-1)
Biological Resources	No impact	Clear 117 acres of trees (no active RCW sites)	No impact	Clear 40 acres of trees, loss of potential RCW foraging area	Clear 72 acres of trees, loss of potential RCW foraging area
Water Resources (floodplains, ground H ₂ O, surface H ₂ O, wetlands)	No impact	25,270 ft ² of impervious surface	7,100 ft ² impervious surface	No impact	Boundary of range close to high slope area
Geology and Soils	No impact	Some soil disturbance when removing trees/ under story	No impact	Some soil disturbance when removing trees/ under story	Some soil disturbance when removing trees/ under story
Hazardous materials/waste	No impact	No impact	No impact	Asbestos and LBP in building	Asbestos and LBP in building;
Cultural Resources	No impact	No impact	No impact	No impact	No impact
Safety	No impact	UXO concerns on proposed range	No impact	UXO concerns on proposed range	UXO concerns on proposed range
Noise	No impact	No impact	No impact	No impact	No impact
Air Quality	No impact	No impact	No impact	No impact	No impact
Socioeconomic	No impact	No impact	No impact	No impact	No impact
Aesthetics	No impact	Removal of trees	No impact	Removal of trees	Removal of trees
Mission Conflicts	Conflict with BISS operations	Hellfire missions 3-4 times/year	Conflict with BISS operations	Minimal Conflict with TA C-52	Minimal Conflict with TA C-52
Land Use	No impact	Conversion of current hunting area to test area	No impact	No impact	No impact

3.0 AFFECTED ENVIRONMENT

This chapter describes the various environmental receptors that can be found within the area west of Test Area C-53 and around Site C-1. Different aspects of the proposed action could potentially affect these receptors. The chapter is organized by the following issues: biological resources, water resources, geology and soils, hazardous materials/hazardous waste, cultural resources, safety and occupational health, noise, air quality, socioeconomics, aesthetics, land use, and mission conflicts. The biological resources section describes the Sandhills Ecological Association, within which both alternative sites are located. This section will discuss flora and fauna found in this association, as well as those species that are threatened or endangered. Water resources describe floodplains, surface waters, groundwater, and wetlands. The geological origins of this area as well as the predominant soil associations will be discussed. Hazardous material/hazardous waste evaluation includes an examination of LBP and ACM. Designated areas for cultural resources near water bodies are described. Major range and occupational safety issues are discussed, and includes an evaluation of non-associated activities that are in proximity to the preferred action location and alternative location sites.

3.1 Biological Resources

3.1.1 Sandhills Ecological Association

The majority of Eglin AFB is underlain by Lakeland soils, which support the Sandhills Ecological Association (Figure 11). These soils are deep, sandy, excessively drained, and have little shrink-swell potential (U.S. Air Force 1995). The Sandhills association is characterized by rolling sand hill ridges dissected by streams and includes pockets of habitat ranging from steeply sloped to flat and xeric (dry) to hydric/mesic (moist). Loamy sands, sandy loams, clay loams, and muck soils are found in lower-lying areas (U.S. Air Force 1995).

Dominant trees include stands of longleaf pine and sand pine, along with oaks and magnolia. Past management and timber-collecting activities have enabled sand pine stands to replace the longleaf pine stands. The area surrounding Site C-1 is densely forested and contains several large stands of mature longleaf pine trees. The preferred site location, west of TA C-53, also contains longleaf pines, but the trees are more sparse and do not comprise a contiguous stand. This is due to the area once being a planned longleaf restoration area, where nuisance trees such as sand pine were cut to facilitate the regeneration of longleaf pines. Low shrubs comprise an important group and include saw palmetto, persimmon, dwarf huckleberry, gopher apple, and various oaks (U.S. Air Force 1995). Various grasses, herbs, lichens, and several rare plants comprise the under story (U.S. Air Force 1995). Some of the dominant plant families include the sunflower (*Asteraceae*), milkweed (*Asclepiadaceae*), sedge (*Cyperaceae*), heath (*Ericaceae*), pea (*Fabaceae*), grass (*Poaceae* or *Gramineae*), buckwheat (*Polygonaceae*), and yellow-eyed grass (*Xyridaceae*) (USAF 1995). Vegetation surrounding ponds and the shoreline of creeks can include grasses and herbs or a dense shrub thicket. Typical plants include panicum, rushes, arrowheads, yellow-eyed grass, meadow beauty, and spike-rush. Floating plants such as water lilies can cover much of the water surface of quiet waters (U.S. Air Force 1995).

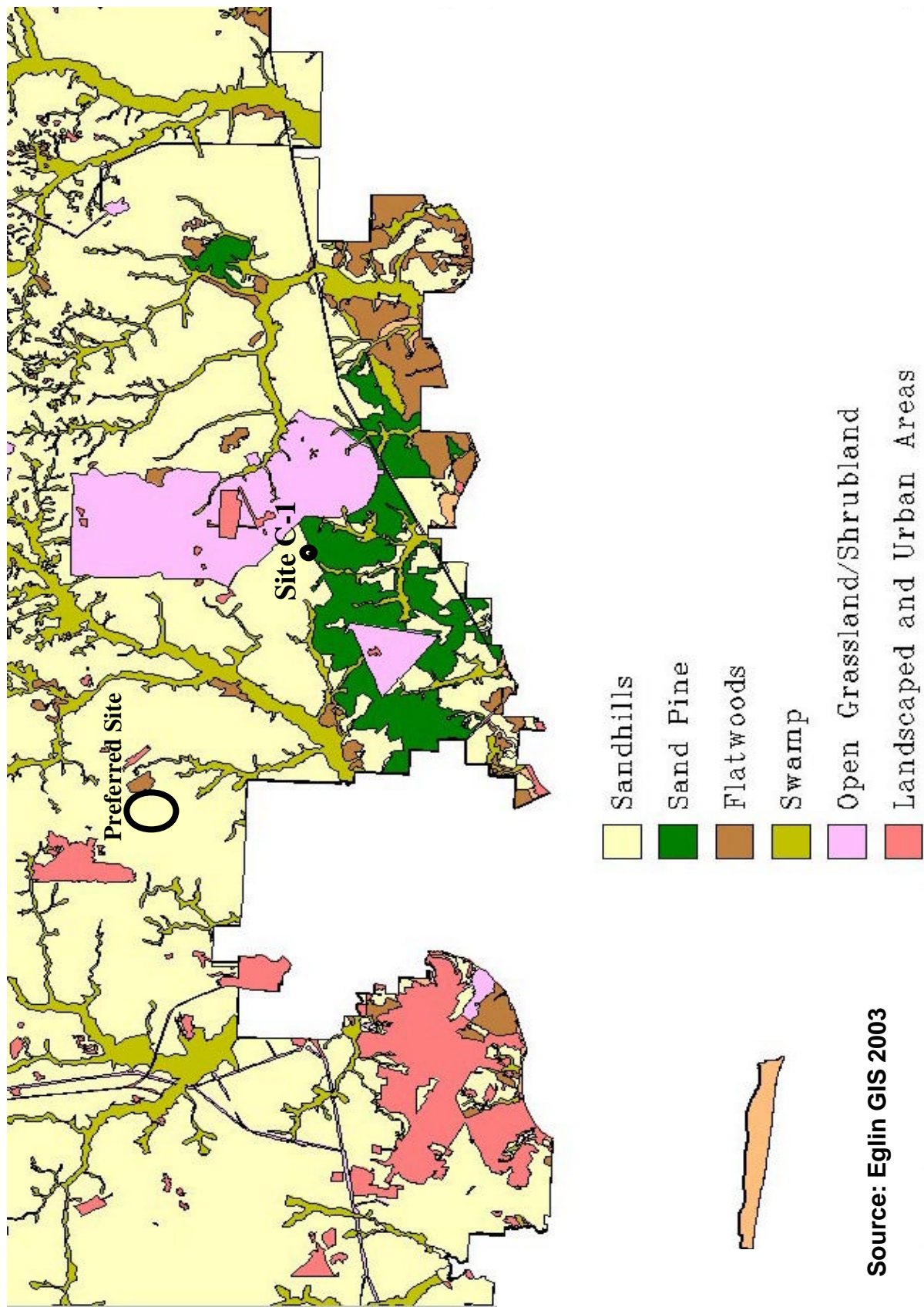


Figure 11. Ecological Associations Near Alternative Action Sites

The barking tree frog and central newt are representative amphibians to the Sandhills Ecological Association. Leopard frogs are found in swales containing wetlands. The gopher frogs utilize ephemeral ponds (including depression marshes) and Sandhills upland lakes for breeding (provided there are no fish present). Gopher frogs also are found in the surrounding upland areas (U.S. Air Force 1995). Reptiles include the gray rat snake, coral snake, six-lined racerunner, the Eastern fence lizard, gopher tortoises, box turtles, eastern diamondback rattlesnakes, cottonmouths, and the eastern coach whip. Mammals include several types of squirrels (the fox, gray, and flying), armadillo, feral pig, white-tailed deer, and raccoon. Characteristic predators include the gray fox and bobcat. On occasion, the Florida black bear is found in the Sandhills Ecological Association (U.S. Air Force 1995).

Raptors include the screech owl, red-shouldered hawk, and the great horned owl, which nest and hunt prey in the Sandhills woodlands (U.S. Air Force 1995). The southeastern kestrel preys on small rodents, reptiles, and insects in clearings or woodland edges. Game birds include wild turkeys, wood ducks, and mourning doves. The sand hill upland lakes provide feeding areas for wading birds. Other indigenous birds include warblers, vireos, red cockaded woodpeckers, pileated woodpecker, white-breasted nuthatch, Bachman's sparrow, and the loggerhead shrike. There are birds that winter in South and Central America and come to temperate regions, such as the continental United States, to breed in the summer. Important habitat for these neotropical migrants is the high quality Sandhills within the Sandhills Ecological Association (U.S. Air Force 1995).

Many aquatic species are found in the streams within the Sandhills Ecological Association. Burrowing worms, crustaceans, and other pelagic and benthic organisms, endemic to most freshwater bodies, are also plentifully represented in Sandhills streams. Numerous species of fish have been found in all creek systems, including: pirate perch, mosquito fish, southern brook lamprey, spotted sunfish, largemouth bass, sailfin and flagfin shiners, black and speckled madtoms, pygmy sunfish, sharpfin chubsucker, blackbanded and brown darters, and the Okaloosa darter (U.S. Air Force 1995).

3.1.2 Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 requires that Federal agencies must seek to conserve protected species through the cooperation with state and local authorities. There are several species of concern at Eglin AFB, including plants and animals that have been given the status of a federally protected species, species proposed for federal listing, or a state species of special concern (U.S. Air Force 2001).

- An **endangered species** is one that is in danger of extinction throughout all or a large portion of its range.
- * A **threatened species** is any species that is likely to become endangered within the future throughout all or a large portion of its range (due to factors such as loss of habitat and anthropogenic effects)
 - * A **candidate species** is one for which the U.S. Fish and Wildlife Service (USFWS) has on file sufficient information on biological vulnerability to either warrant a listing, upgrading, or downgrading of classification

Table 3.1. Sensitive Plant Species in the Sandhills Ecological Association

Sensitive Species	Federal/State Status	Habitat
Plants		
Three-awn grass (<i>Aristida simpliciflora</i>)	FC2	Sandhills with sparse grass or scrubby flat woods
Pineland wild indigo (<i>Baptisa calycosa</i>)	FC2	Sandhills where the over story is open with sandy soils.
Pineland hoary-pea (<i>Tephrosia mohrii</i>)	FC2/ST	Sandhills throughout Eglin AFB range
Panhandle meadow beauty (<i>Rhexia salicifolia</i>)	FC2	Sand hill upland lakes, scattered over Eglin AFB range
Toothed savory (<i>Calamintha dentata</i>)	FC2	Populations on Eglin AFB found in upland areas
Ashe's magnolia (<i>Magnolia ashei</i>)	FC3/SE	Steep head ravines
Orange azalea (<i>Rhodoendron austrinum</i>)	FC3/SE	Slope forest in underbrush
Pyramid magnolia (<i>Magnolia pyramidata</i>)	SE	Slope forest in underbrush
Silky camellia (<i>Stewartia malacodendron</i>)	SE	Slope forest, steep head ravines
Mountain laurel (<i>Kalmia latifolia</i>)	ST	Slope forest in underbrush
Florida anise (<i>Illicium floridanum</i>)	ST	Steep head ravines

- FC1= Category 1 candidate for listing by the Federal Government where sufficient biological information is available to support a proposal to list the species as endangered or threatened
- FC2= Category 2 candidate for listing by the Federal Government where existing information indicates the species may warrant listing, but where substantial biological information is lacking to support a proposed rule
- FC3= Category 3 candidate for listing by the Federal Government where enough information exists to downgrade an FC1 or FC2 species so that it is no longer considered for listing but is being watched for changes in status
- FE= Listed as endangered by the Federal Government
- FT= Listed as threatened by the Federal Government
- SE= Listed as endangered by the State of Florida
- SSC= Florida Species of Special Concern
- ST= Listed as threatened by the State of Florida

(Source: U.S. Air Force 1995 taken from Florida Natural Areas Inventory (FNAI) 1994 survey)

Table 3.2. Sensitive Animal Species in the Sandhills Ecological Association

Sensitive Species	Federal/State Status	Habitat
Animals		
Okaloosa darter (<i>Etheostoma okaloosae</i>)	FE/SE	Restricted to six small Choctawhatchee Bay tributaries
Red cockaded woodpecker (<i>Picoides borealis</i>)	FE/ST	Old growth longleaf pine forests in Sandhills throughout Eglin AFB
Eastern indigo snake (<i>Drymarchon corais couperi</i>)	FT/ST	In uplands and wetlands in the Sandhills
Florida black bear (<i>Ursus americanus floridanus</i>)	ST	Found in Sandhills, Flatwoods, and Swamps
Southeastern American kestrel (<i>Falco sparverius paulus</i>)	FC2/ST	Permanent resident of the Sandhills and Open Grassland/Shrub land
Bachman's sparrow (<i>Aimphila aestivalis</i>)	FC2	Resides in high-quality portions of the Sandhills
Florida pine snake (<i>Pituophis melanoleucus</i>)	FC2/SSC	Retreats to loosely packed sand, rodent burrows and gopher tortoise burrows
Gopher tortoise (<i>Gopherus polyphemus</i>)	FC2/SSC	Found in Sandhills communities around base; reside in burrows
Dusky gopher frog (<i>Rana capito sevosa</i>)	FC1/SSC	Found in Sandhills and near seasonally flooded ponds lacking large predatory fish

- FC1= Category 1 candidate for listing by the Federal Government where sufficient biological information is available to support a proposal to list the species as endangered or threatened
- FC2= Category 2 candidate for listing by the Federal Government where information indicates the species may warrant listing, but where substantial biological information is lacking to support a proposed rule
- FC3= Category 3 candidate for listing by the Federal Government where enough information exists to downgrade an FC1 or FC2 species so it's no longer considered for listing but is being watched for changes in status
- FE= Listed as endangered by the Federal Government
- FT= Listed as threatened by the Federal Government
- SE= Listed as endangered by the State of Florida
- SSC= Florida Species of Special Concern
- ST= Listed as threatened by the State of Florida

(Source: U.S. Air Force 1995 *taken from FNAI 1994 survey*)

Once species are legally protected, it is a violation of federal law to “take” protected species unless legally exempted to do so. *Taking* is defined as “...harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct” (16 U.S.C. § 1538 1973). The threatened and endangered plant species found in the

Sandhills Ecological Association are listed in the above table. Their federal and state listing status is given, including the specific habitats in which they can be found. The threatened and endangered animal species found in the Sandhills Ecological Association is also listed above. Their federal and state listing status is given, including the specific habitats in which they can be found.

3.1.2.1 Threatened and Endangered Species, Proposed LDERF Site (Area West of TA C-53)

Threatened and endangered species found around the preferred action site are shown in Figure 12. There are no threatened and endangered species in the proposed LDERF site location, nor are any sensitive species in the area proposed for the outdoor LADAR range cone. Several RCW cavity trees are located north, east, and west of the LDERF and range cone. It was determined in April by Bob Miller, AAC/EMSP, that all cavity trees in this area are inactive. The closest inactive cavity tree will be located 95 feet from the western edge of the 2 km cone perimeter. The next closest inactive cavity tree is approximately 185 feet from the 2 km cone perimeter. The federally endangered Okaloosa Darter is found in branches of Turkey Bolton and Long Creeks, located to the west and east of the proposed LADAR range, respectively.

3.1.2.2 Threatened and Endangered Species, Site C-1

Threatened and endangered species found around Site C-1 are shown in Figure 13. There are no threatened and endangered species at Site C-1 or in the areas proposed for the outdoor LADAR ranges. However, the federally endangered Okaloosa Darter is found in Long Creek, north of Site C-1. In addition, two inactive RCW cavity trees are located northwest of Long Creek, but would not be impacted by any activities proposed at Site C-1.

3.2 Water Resources

3.2.1 Floodplains

3.2.1.1 Proposed LDERF Site (Area West of TA C-53)

Streams southeast and southwest of the preferred alternative location belong to the Rocky Creek watershed, which ultimately drain into Rocky Bayou (Figure 14). The headwaters of a tributary of Turkey Bolton Creek (point G in Figure 15) are located approximately 1322 ft. west of the 2 km LADAR range cone perimeter (Figure 15). This is the closest stream location to the proposed action area. Turkey Bolton Creek flows directly to Rocky Bayou. The headwaters of a tributary of Long Creek is located southeast of the proposed outdoor LADAR range. Long Creek flows into Rocky Creek, which then terminates at Rocky Bayou. According to current Federal Emergency Management Agency (FEMA) 100-year floodplain map (Figure 16), the proposed LDERF site and the proposed LADAR test range fall outside the range of such a flooding event (Eglin AFB 2003). According to data layers from the Eglin GIS FEMA map, there is little risk of flooding of the proposed range due to the large difference in elevation from the creek head to the area where the range would be located. According to the FEMA flood map, there is a 30-35' change in elevation from the creek bed to the elevation of the range. Even if hurricane events were to push storm surge up the watershed, there would be little risk due to the creek being too

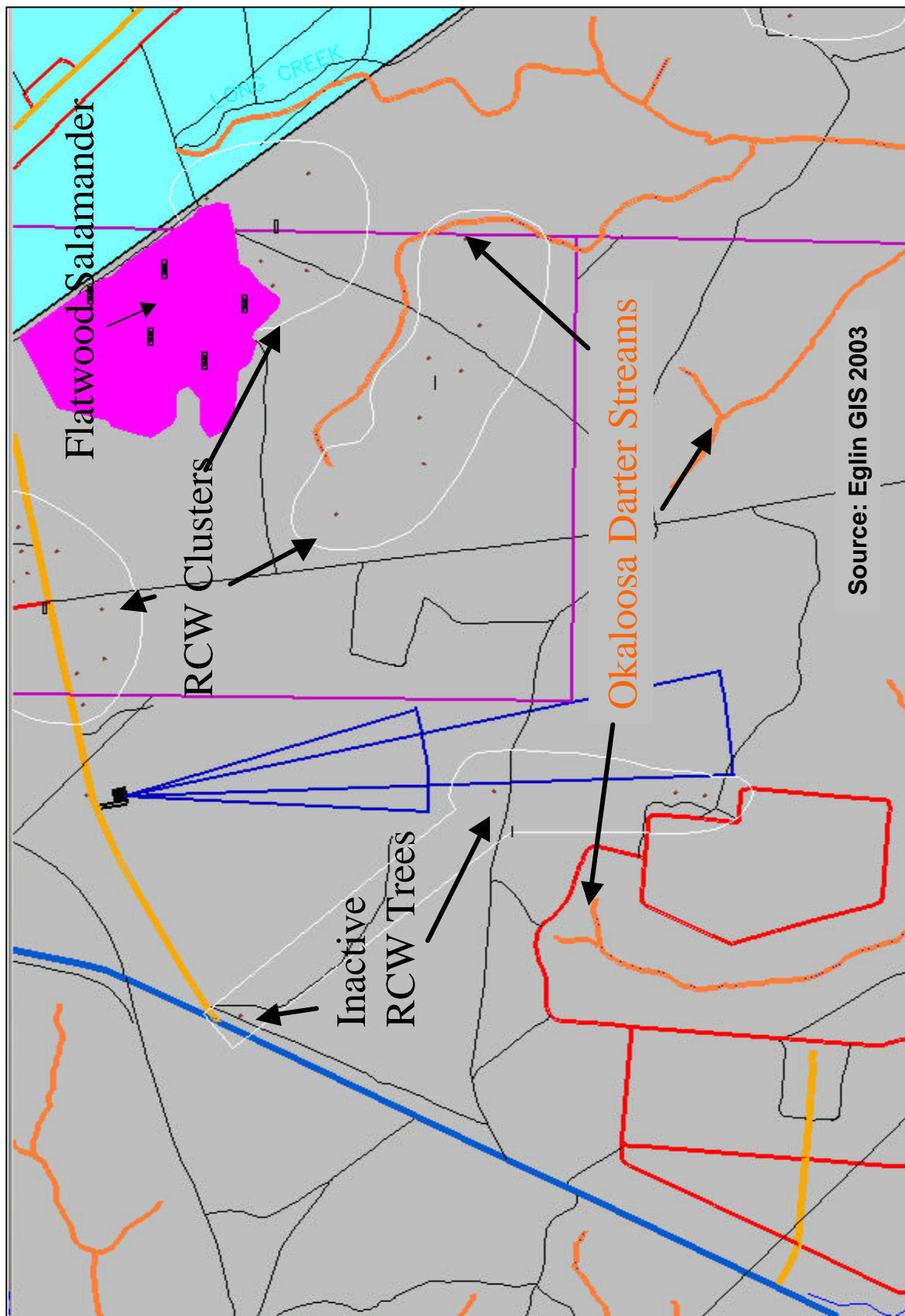


Figure 12. Location of Key Threatened and Endangered Species Relative to the Preferred Action Site (west of TA C-53)

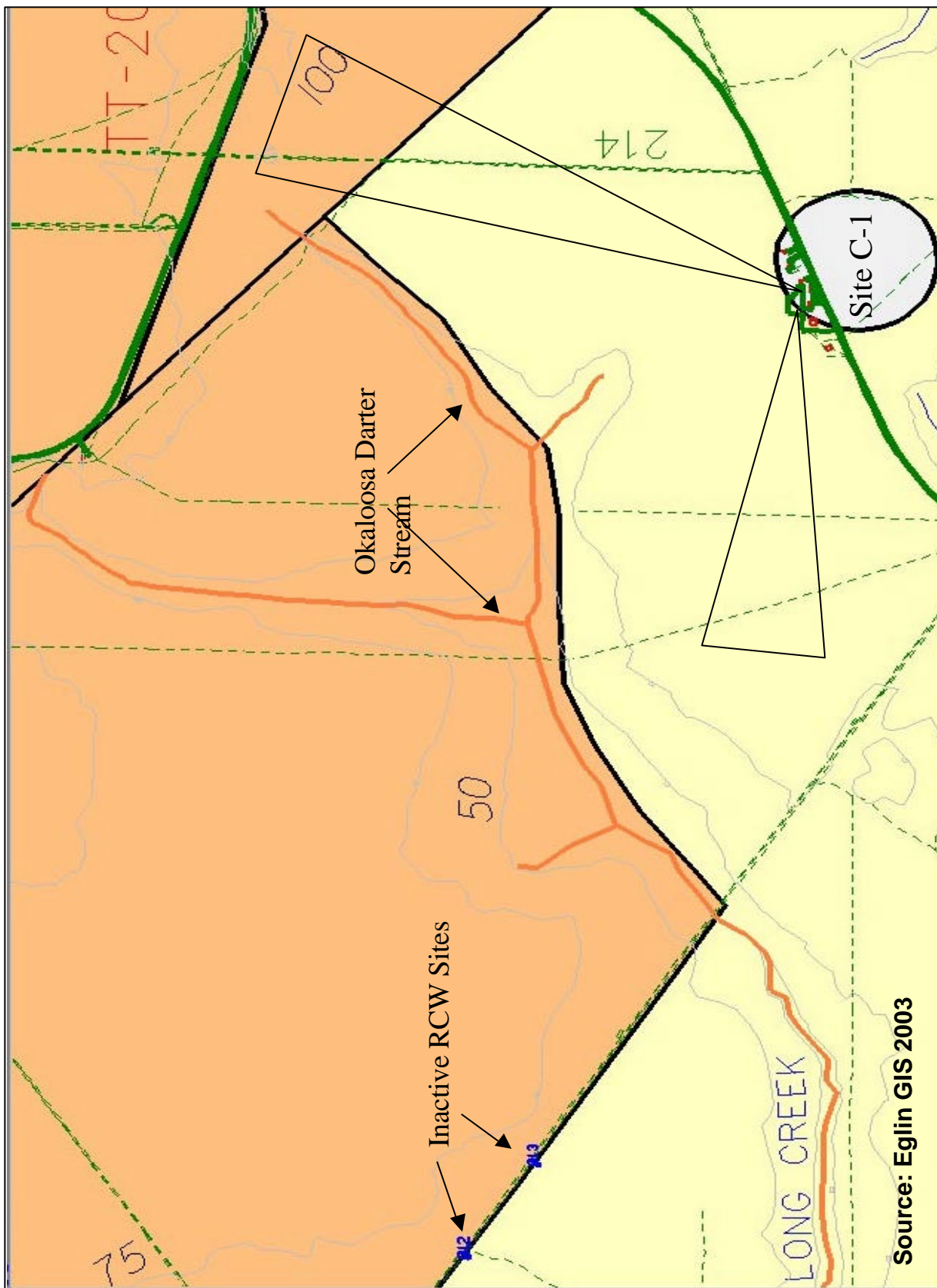


Figure 13. Location of Key Threatened and Endangered Species Relative to Site C-1

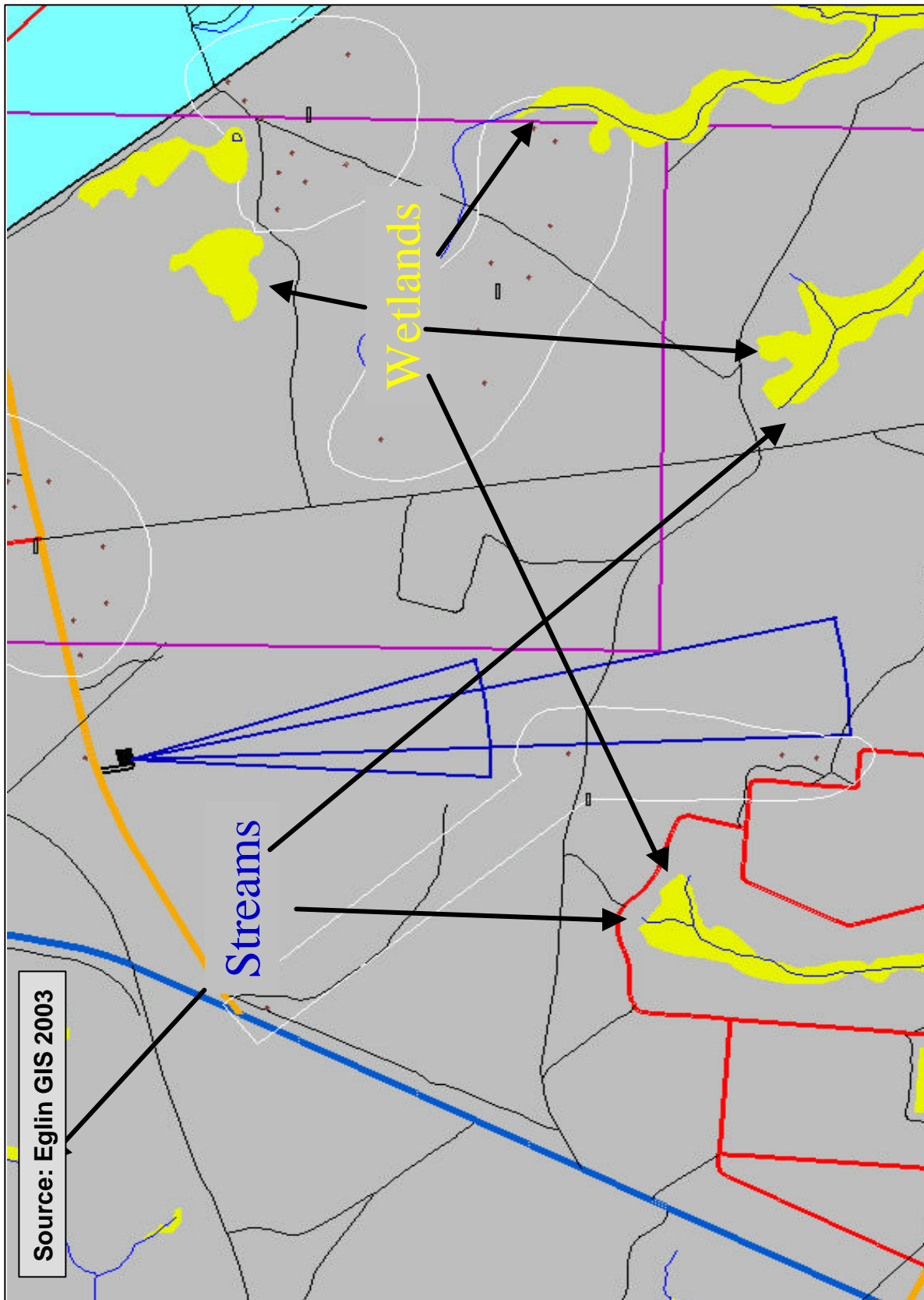


Figure 14. Location of Preferred Action Site (west of TA C-53) to Streams and Demarcated Wetlands

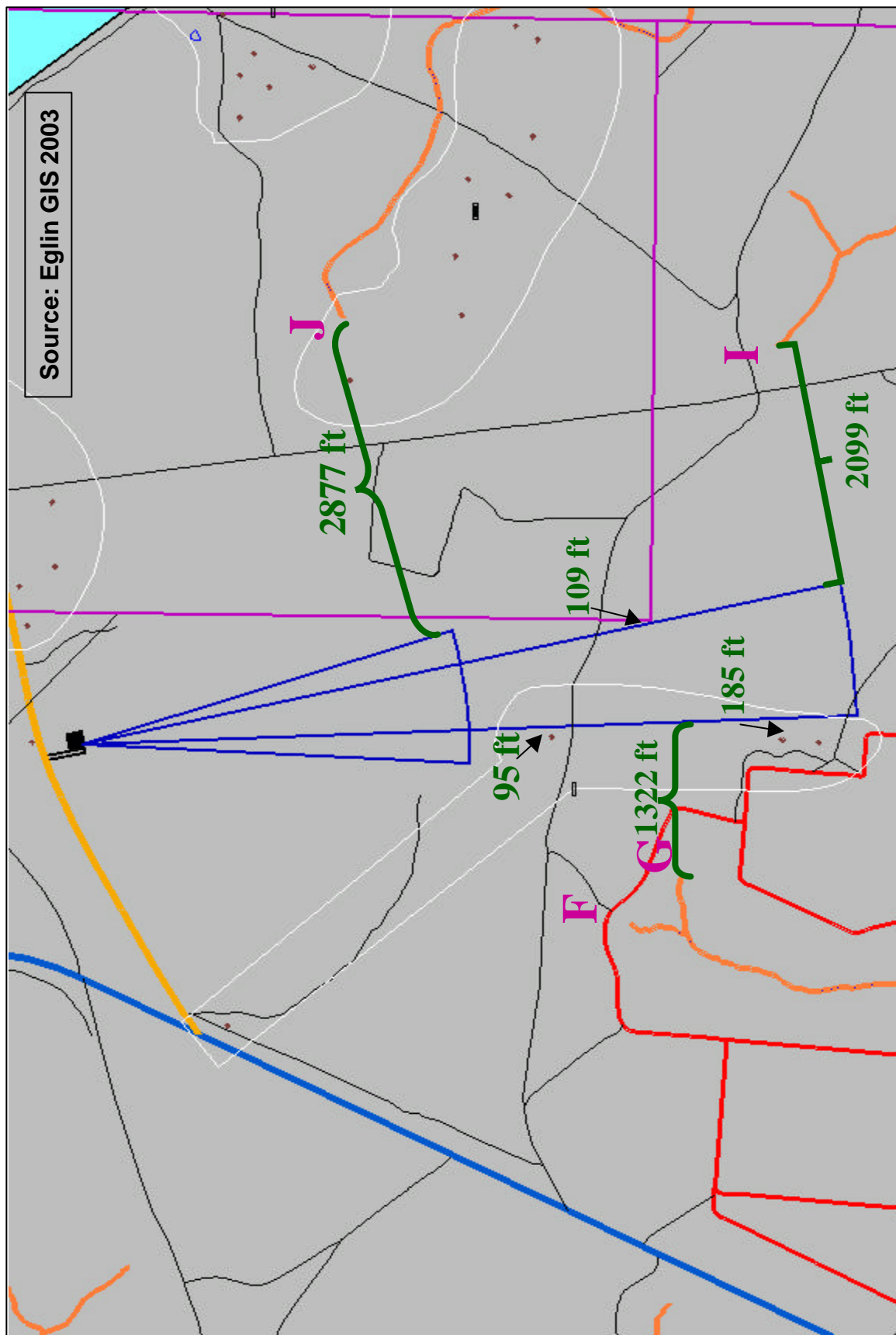


Figure 15. Distance of Stream Headwaters to the Cone Perimeter of the Outdoor LADAR Range

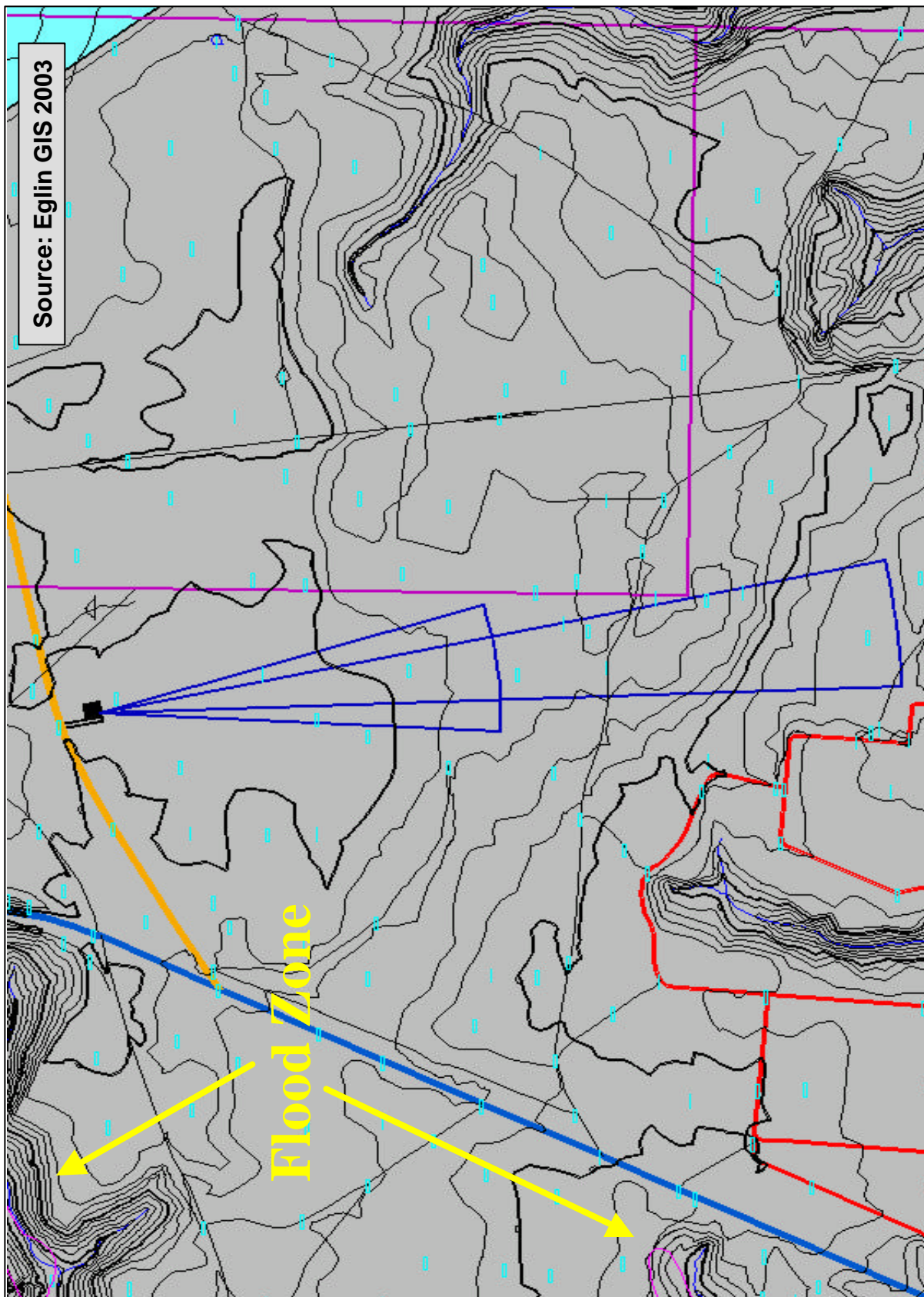


Figure 16. FEMA 100-Year Floodplain Map with 5-ft. Topographic Contour Intervals

small to overcome such a large break in slope (Eglin AFB 2003).

3.2.1.2 Site C-1

Streams north of Site C-1 also belong to the Rocky Creek watershed. According to the FEMA 100-year floodplain maps, Site C-1 and the proposed outdoor LADAR ranges in Alternatives 4 and 5 fall outside the influence of such a flooding event (Figure 17) (Bristol 1999). Thus, there is little risk of flooding of any proposed ranges at this site as well. According to Figure 17, there is a 40-45' elevation change from the creek bed to the elevation of the proposed range. As with the proposed LDERF west of TA C-53, there would be little risk that a hurricane event would push storm surge up the watershed enough to flood the area (Bristol 1999).

3.2.2 Surface Waters

3.2.2.1 Proposed LDERF Site (Area West of TA C-53)

The tributaries of Long Creek and Turkey Creek provide habitat for the endangered Okaloosa Darter. Substrates are predominantly sand with varying amounts of detritus along stream margins and in pool and eddy areas. The pH of the creeks range from 6.2 to 6.7 and are considered relatively sterile. Depths in the streams range to about five feet, and the headwaters of Long Creek have depths of approximately 2-3 ft. These streams are shaded through most of their course with winter water temperatures being cool (45 to 49 degrees Fahrenheit) and summer temperatures warming to 72 to 75 degrees Fahrenheit (U.S. Air Force 1997).

3.2.2.2 Site C-1

Long Creek and the creeks found in Test Areas C-52W, C-52N, and C-52A, provide habitat for the endangered Okaloosa Darter and have the same physical and chemical conditions as described above.

3.2.3 Wetlands

Wetlands are considered sensitive environmental habitats on Eglin AFB. Although wetlands are most prominent in the Flatwoods and Swamp ecological associations, some riparian wetland areas can be found in the Sandhills Ecological Association.

3.2.3.1 Proposed LDERF Site (Area West of TA C-53)

According to Figure 14, there are areas west and south of the proposed LADAR range that are classified as wetlands. After a site visit conducted on 29 April 2003, it was determined that these areas, should they exist, are very narrow at the headwaters of the respective streams that they border. This is due to the very high slope, narrow area, and more V-shaped topographical contour characteristic of primary stream headwaters. Some Sweet Bay, Titi, and Gallberry were noted near the headwaters. At the headwaters of a branch of Long Creek, 2877 feet east of the proposed 20-degree cone, there is a small, depressional marsh populated with Blue Maiden cane (*Amphicarpum muhlenbergianum*) (point J on Figure 15).

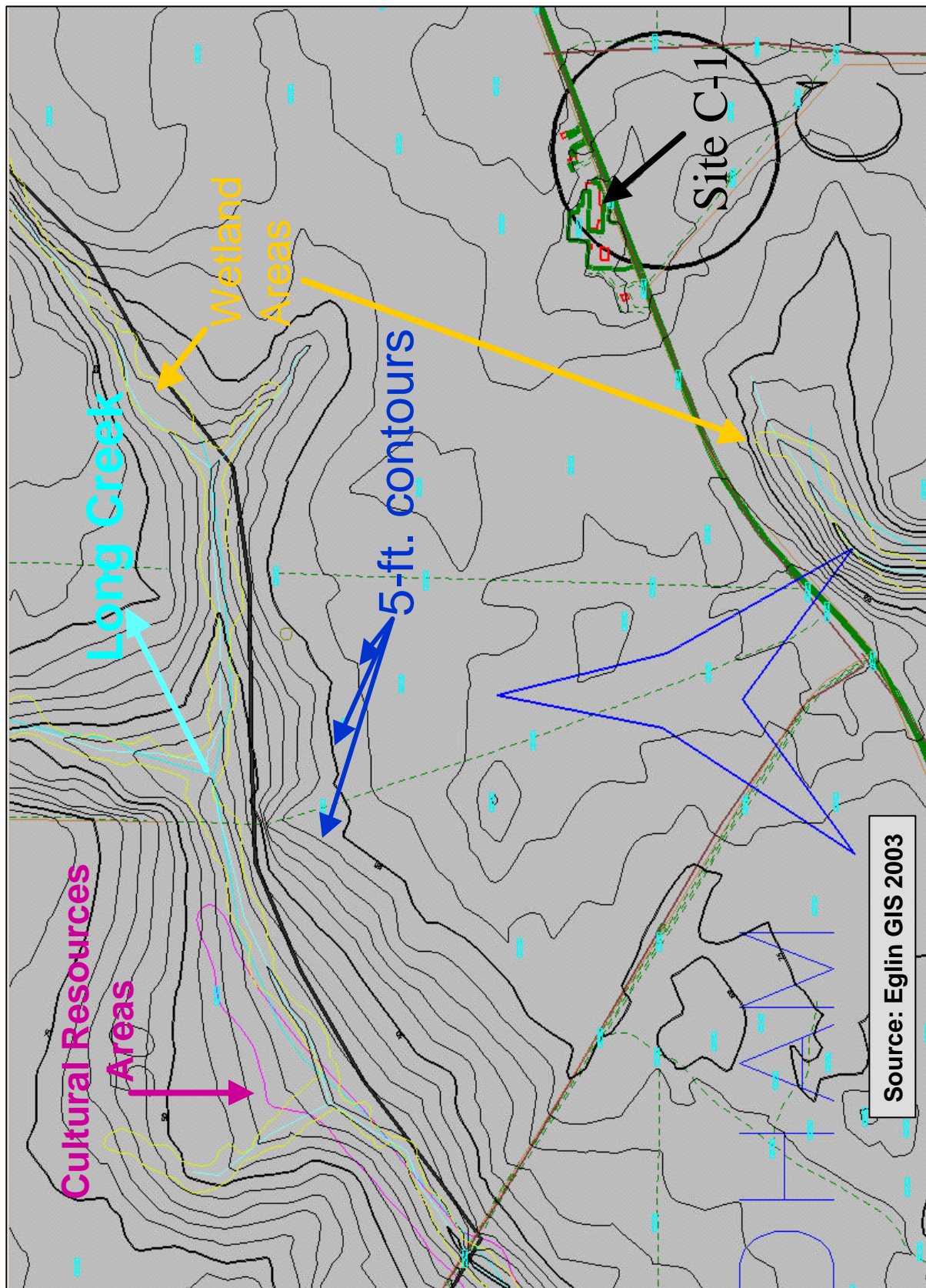


Figure 17. FEMA 100-Year Floodplain Map with 5-ft. Topographic Contour Intervals and Wetland Demarcation, Site C-1

3.2.3.2 Site C-1

According to Eglin GIS coverages, narrow strips of wetland can be found along Long Creek and other creeks near the TA 52 Complex. Long Creek and Turkey Creek are spring-fed streams, where ground water bubbles up through the geological matrix to the surface to form the stream's headwaters. The wetland areas along these streams are classified as riparian wetlands, following along the perimeter of the stream. These areas are very narrow given the almost immediate slope from the creek bed to the upland areas (Figure 17) (U.S. Air Force 1995). Riparian wetlands are flowing systems, such as streams or creeks, and include alluvial streams, seepage streams, and spring-fed streams. The riparian wetlands southwest and southeast of the proposed LADAR test range are classified as "palustrine forested" wetland, or mixed forested wetland. Plants such as Titi, Smilax, and Sweet Bay are found in this area (Eglin AFB 2003).

3.2.4 Groundwater

The two aquifers located under Eglin Air Force Base are the Sand and Gravel Aquifer and the Floridan Aquifer. The Sand-and-Gravel Aquifer consists of the Citronelle formation and marine terrace deposits. Eglin uses only a small amount of water from the Sand and Gravel Aquifer; most potable water is derived from the Floridan Aquifer. The Floridan Aquifer is located below the Sand and Gravel Aquifer and extends beneath most of Florida (U.S. Air Force 1995). This aquifer is shallower in the eastern portion of the base. Below the proposed LDERF site west of TA C-53, the depth to groundwater is 25-50 feet below land surface (BLS). The surficial Sand-and-Gravel aquifer should extend to 105 feet BLS. The Pensacola Clay formation, an aquaclude that hydraulically separates the shallow Sand and Gravel Aquifer from the deep Floridan Aquifer, is 315-feet thick in this area. Depth to the top of the Floridan Aquifer is 420 feet BLS (Bjorklund 2003).

At Site C-1, the groundwater is only 15-30 feet BLS and the surficial aquifer extends to 75 feet BLS. The Pensacola clay aquaclude is less thick in this area, 185 feet thick, and the top of the Floridan Aquifer is shallower at 260 feet BLS (Bjorklund 2003).

3.2.5 Storm water

Storm water is defined as rain runoff from roofs, roads, parking lots, above ground storage tanks (AST) and other type of surface structures (U.S. Air Force 2001). When rainwater impacts such surfaces, it mixes with any residual chemicals, POL, or other types of substances. Such pollutants, if not properly managed, can be discharged into local streams, bayous, and bays.

3.2.5.1 Proposed LDERF Site (Area West of TA C-53)

Since impervious surface will be created at this location (new building foundations, access road, and parking lot), per 62-25 Florida Administrative Code (FAC), structures will need to be built to contain runoff from any storm event (Brown 2003). Once the final amount of finished impervious surface is calculated, a storm water swale will be designed to comply with physical and functional requirements outlined in 62-25. In addition to the creation of impervious areas, the creation of areas of disturbed soil must also be considered. When a site is graded or trees and

vegetation are removed, the soil is considered “disturbed.” Unlike the swale exemptions that can be obtained under 62-25 FAC, 62-621 does not have such exemptions. If greater than 1 acre of area is disturbed, the proponent must apply for a National Pollutant Discharge Elimination System (NPDES) permit. If this is the case, the site operator must devise a storm water pollution prevention plan, which outlines erosion controls that will be implemented at the site, such as laying sod, adding hay bales, silt fences during construction, etc. During construction, the building contractor would be required to inspect and assess site conditions once a week and after 24 hour storm events (Brown 2003).

3.2.5.2 Site C-1

Since Site C-1 has an existing building (Building 8777), access road, and parking areas, no additional impervious surface will be created.

3.2.6 New Facility Water Requirements, Proposed LDERF Site (Area West of TA C-53)

Since a new facility is being proposed at this site, there will be new water consumption requirements for this area. The new LDERF will require a well for water consumption, fire suppression, and septic system support. Establishment of a well to draw potable water from the Floridan Aquifer would require a consumptive use permit. This permit would govern how many gallons of water could be pumped from the well per day (Brown 2003). Water consumption estimates for consumption, septic support, and fire suppression are 25 gallons per person per day. Bathing, irrigation, and clothes washing activities would estimate use at 150 gallons per person per day (Rackard 2003). A septic tank and leach field would be installed to handle sanitary waste, but would require no permits. Xerascaping, which is landscaping with native flora that will not require irrigation, will be the preferred landscape method. No potable well water will be used to irrigate this site.

3.3 Geology and Soils

Underlying both Site C-1 and the area west of TA C-53 are unnamed Holocene to Pliocene-type sands and the Citronelle Formation, which consists of approximately 250 feet of dominantly non-marine quartz sands with some gravel and relatively thin clay lenses. Kaolinite is the primary clay found and has very little shrink-swell potential. Underneath these formations is the Alum Bluff Group, which is a Miocene-aged coarse clastic (Alum Bluff Group) marine deposit up to several hundred feet thick. Clastic sedimentary rock comes from the cementation of fragments of rock. The Alum Bluff Group is underlain by several hundred feet of early Miocene and Oligocene marine limestones (Bruce Creek, Tampa, Chickasawhay, and Ocala). All of these units dip gently southwestward in the Gulf Coast geosyncline, a down-warpage continental margin in the earth's crust that has experienced sedimentation and volcanic activity (U.S. Air Force 1995).

The soils at both sites belong to the Lakeland association, which have developed from the Citronelle Formation and alluvial material (gravel, sand, silt, and clay deposited by water) in the floodplains of Rocky Creek and lowland areas. Typically, they have sandy surface layers with sandy sub soils that are more than 80 inches deep. These soils are primarily excessively drained,

brownish-yellow sands that range in pH from 4.5 to 6.0, contain less than 1% organic matter in the top 0 to 40 inches of soil, and have very low cation exchange capacity. The Lakeland soils lack cohesiveness and have limited water-holding capacity. The establishment and maintenance of vegetation is difficult because the soils are too wet, too sandy, low in productivity, or are on steep slopes (U.S. Air Force 1997).

3.4 Hazardous Materials/ Hazardous Waste Management

3.4.1 Proposed LDERF Site (Area West of TA C-53)

Site C-3, the current location for LDERF operations, is categorized as a small hazardous materials user. Site processes that use hazardous materials generally fall into circuit board manufacturing and associated processes. All hazardous materials are segregated, depending on type, and are stored in cabinets. The AFRL/MN Hazardous Materials/Waste Manager creates hazardous material “kits” for each AFRL remote research site, including only the amount of material necessary to accomplish set technical processes. All unused or empty hazardous material containers are returned to the AFRL Hazardous Materials Pharmacy. The AFRL Hazardous Materials/Waste Manager determines hazardous materials usage rates through monthly inspections, and determines if a hazardous material has become a waste (Fortenberry 2003). Hazardous materials usage will remain the same at the new proposed LDERF west of TA C-53. Types of hazardous materials will also remain generally the same at the new site. The only potentially new hazardous material that may be introduced in the area is a woody herbicide to treat any emergent woody growth after the trees are clear-cut. Herbicides such as Garlon 4 could be used for this purpose.

Because of the “kit” process, there are no initial accumulation point (IAP) sites or 45-day sites to store hazardous wastes. All hazardous wastes are handled through the AFRL Hazardous Materials/Waste Manager.

3.4.2 Site C-1

Lead-Based Paint (LBP)

Modification of the interior of Building 8777 could potentially expose workers to LBP. According to the Bioenvironmental Engineering Flight (96 AMDS/SGPB), the paint on the walls of Building 8777 is LBP (Kirksey 1999). Waste containing levels of lead exceeding a maximum concentration of 5.0 milligrams per liter, as determined using the USEPA Toxic Characteristic Leaching Procedure, is defined as hazardous under 40 Code of Federal Regulations (CFR) 261, as adopted by the FDEP, 62-730.030 FAC. *The Air Armament Center Lead-Based Paint Management Plan* (AAC 32-4), completed in 2002, addresses all federal, state, and Air Force guidance, assigns responsibilities, and describes compliance methods (U.S. Air Force 2002).

Asbestos-Containing Materials (ACM)

The interior modification of Building 8777 could potentially expose workers to ACM. However, this is dependent on the level of modification to be performed. At this point, there is no plan as

to what level the building would be modified or renovated. According to 96 AMDS/SGPB, non-friable asbestos is present in floor tiles both throughout the building and around pipes in the ceiling above the mechanical room. ACM can be divided into two categories: friable and non-friable. Friable ACM is defined as any material containing more than 1 percent asbestos by weight (as determined by using the method specified in 40 CFR 763) that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. Non-friable ACM are materials that contain more than 1 percent asbestos by weight, but do not meet the rest of the criteria for friable ACM (U.S. Air Force 1995). It was noted that both the ceiling and the floor tiles in Building 8777 were in good condition. Building refurbishment could take place without disturbing the ACM and potentially negatively affecting the health of workers at the site (Kirksey 1999).

3.5 Installation Restoration Program (IRP)

3.5.1 Proposed LDERF Site (Area West of TA C-53)

There are no active IRP sites that exist in the area of the proposed LDERF and outdoor LADAR range. The IRP is used by the Air Force to identify, characterize, and remediate past environmental contamination on Air Force installations. The IRP has established a process to evaluate past disposal sites, control the migration of contaminants, identify potential hazards to human health and the environment, and remediate the sites (U.S. Air Force 1995). Table 3.3 and 3.4 list the closest IRP sites to Range Road 200, directly north of the preferred action location.

3.5.2 Site C-1

One past IRP site, ST-258, is located immediately outside of Building 8777's northern fence line (Figure 6). This site is an old water tower that was previously coated with lead-based paint. The paint had chipped away and had contaminated the soil surrounding the tower with lead. The remediation plan consisted of excavating the soil and then replacing the contaminated soil with clean fill. This site was remediated and closed on 29 April 2002 and the recommendation that no further action be taken at the site was approved by state and federal regulatory agencies (Eglin AFB 2002).

Another IRP site in the vicinity of Site C-1, Area of Concern (AOC) #11, is an old chemical/biological laboratory landfill. The landfill is roughly 1 to 2 acres in size and was in operation from 1964 to 1974. It is a covered ravine containing biological petri dishes, autoclaved materials, nutrients, plastic, wood, alcohols, solvents, central nervous system stimulants, and possibly drums of herbicide that was placed north of Site C-1. In addition, a septic tank on site was also considered an AOC because the tank was possibly contaminated with chemicals poured down the drains of Building 8777. However, a site investigation in 1996 indicated no impacts to the soil or groundwater, and the recommendation was that no further action be taken at the site (Eglin AFB 2002). If the LDERF were established at Building 8777 and an outdoor LADAR range cleared north of Site C-1, the site should receive a bio-hazard sweep in conjunction with an EOD UXO sweep of the range area.

Table 3.3 IRP Sites East of S.R. 285 in Proximity to Proposed LDERF/LADAR Range

Site Number	Size (acres)	Type of Contamination	Status	Distance in ft. from RR 200 (N of LDERF)
POI-306	20.27	Lead	CLOSED	3407
DP-88	5.59	Manganese	CLOSED	4213
POI-318	1.76	Lead	CLOSED	4536

Table 3.4 IRP Sites West of S.R. 285 in Proximity to Proposed LDERF/LADAR Range

Site Number	Size (acres)	Type of Contamination	Status	Distance in ft. from RR 200 (N of LDERF)
DP-11	0.87	Metal/pesticide	CLOSED	3098
POI-338	5.09	Herbicides	CLOSED	3634
AOC-61	0.17	Sewage treatment	CLOSED	3831
AOC-55	0.83	Herbicides	CLOSED	4172

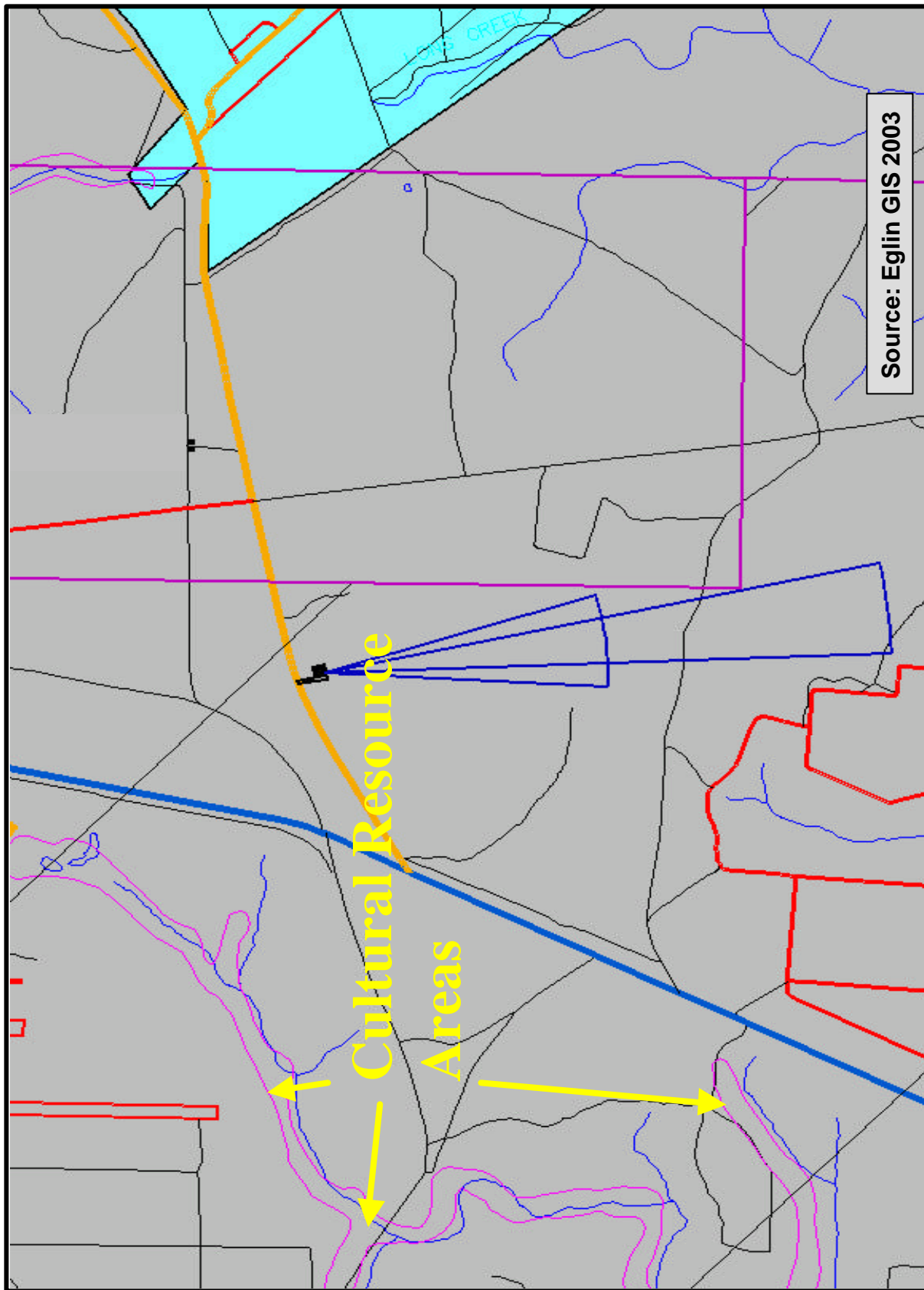
(Source: U.S. Air Force 1995)

3.6 Cultural Resources

Eglin's Cultural Resources Branch has created maps delineating the probability of cultural resource occurrence in a given location. The areas considered to have the highest probability for cultural concerns are located within 200 meters of water and are situated less than 15.2 meters above sea level, have recorded cultural sites, or old maps/documentation indicate unidentified cultural sites may be present. None of these areas have been surveyed for archaeological remains, therefore, the presence, quality or type of resources in these areas are undetermined (Shreve 2003).

3.6.1 Proposed LDERF Site (Area West of TA C-53)

There are no cultural resources sites that exist within the footprint of either the proposed LDERF or proposed outdoor LADAR test range. Figure 18 does show areas outside the proposed action region of influence with a probability of finding cultural resources. These areas include a 200 meter zone around the headwaters of Turkey Bolton Creek to the west of the LADAR range, a zone around the headwaters of another tributary of Turkey Bolton due south, and a zone around the headwaters of Long Creek (southeast of the LADAR range). Unsurveyed areas will not be impacted by the proposed action (Shreve 2003).



3.6.2 Site C-1

Three areas with high probabilities of finding cultural resources are located in proximity to Site C-1 for either Alternative 4 or 5 LADAR test range configurations. According to Figure 17, a 200-meter zone has been marked around the headwaters of a branch of Long Creek (to the north of the facility). Site C-1 does contain cultural resources evidence of turpentine camps from the Rural Industrial Expansion Period (ca. 1881-1940). A site survey in 1999 noted a few trees that had been scored for extraction of pine resin. The extracted pine resin would then be distilled into turpentine. Although no evidence of turpentine distilleries was noted at the site for the proposed northwest-bearing range (Pugh 1999), two Pringle cups were discovered on the range in 2000.

3.7 Safety/Occupational Health

Two major safety issues identified for the proposed LDERF/LADAR range are: (1) concerns about surface/subsurface UXO on the proposed LADAR range, and (2) concerns about radiation safety due to the use of non-eye safe lasers (potential risks to hunters and aircraft).

3.7.1 Unexploded Ordnance

The history of munitions expended on Eglin AFB and resultant explosives contamination is not well documented (U.S. Air Force 1995). All areas that have experienced air-delivered ordnance are assumed to contain subsurface contamination. Explosive Ordnance Requirements cover any test involving any explosive ordnance conducted under static, dynamic, or flight conditions.

Weapons Safety (AAC/SEOW) conducts the management of explosive ordnance at Eglin AFB. Explosives are managed in accordance with AFMAN 91-201, Explosive Safety Standards. Overpressure data requirements must conform to AFMAN 91-201, Explosive Safety Standards. The requirements also provide for Explosive Ordnance Disposal (EOD) personnel to declare the impact locations to be safe prior to anyone entering the area (U.S. Air Force 1995).

The issue of UXO is less well defined. UXO is any munition device containing explosive material that did not detonate upon impact with the surface but still has the potential to detonate. UXO is a potential problem across much of the Eglin Range Complex as a result of past mission activities. Due to consistent, high intensity use over the years (Figure 19), the entire C-52 Complex (other than roads, buildings, and parking lots) is classified as having probable to heavy UXO contamination (Bristol 1999). The UXO resulted from activities from as much as 50 years ago up to the present (U.S. Air Force 1999).

Although both the proposed LDERF west of TA C-53 and Site C-1 are included in this probable contamination area, the exact classes of UXO that may be found at these sites are unknown. Since there is the likelihood that UXO could be present near both sites, a safety sweep would need to be performed to determine the number and classification of UXO. An EOD sweep of the proposed LADAR test range at either site would be required to determine the level of surface contamination of UXO before the area is cleared and used for a test range. If UXO were found, they would be handled in accordance with established EOD practices. Most likely the UXO would be open detonated in place or moved to a range approved for safe open detonation. If the EOD would like to take the UXO off-site for further examination and/or testing, it would be

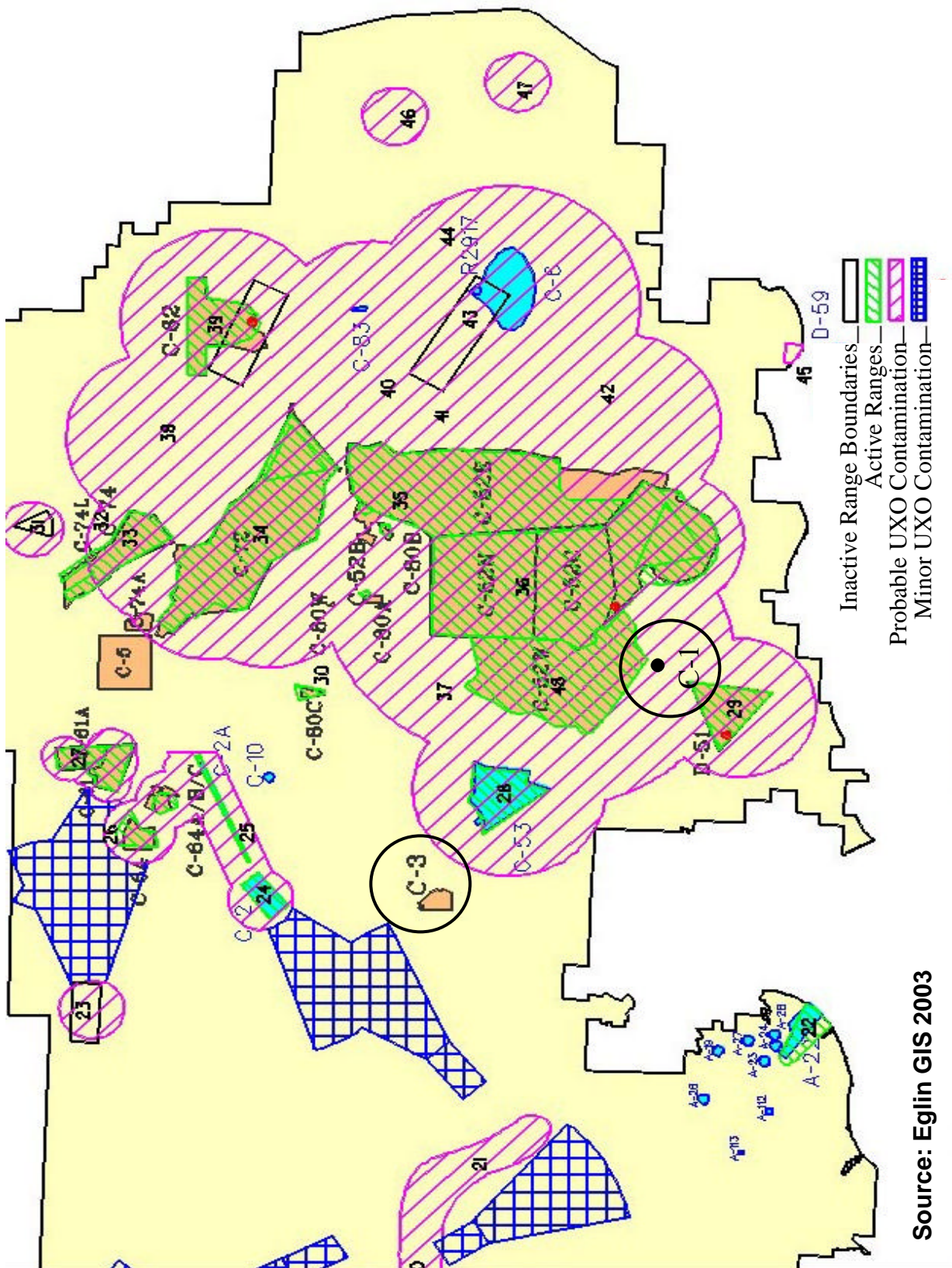


Figure 19. UXO Range Contamination Map

addressed as hazardous waste under the Military Munitions Rule (MMR) of 1997, and all clearance and disposal activities would be subject to the MMR (Robeen 2003).

3.7.2 Radiation Safety

Since non-eye safe lasers would be tested on the proposed LADAR range, non-ionizing radiation concerns would exist at Site C-1. Lasers tested on this range would be non-eye safe up to 700 meters (Gorski 2003). The current Laser Safety Operating Instruction (OI) for Site C-3 must be updated for either Site C-1 or the area west of TA C-53 and be approved by the Eglin AFB Radiation Safety Officer (RSO). The updated OI would highlight site-specific details as well as steps to ensure the safety of authorized and unauthorized personnel (Goplin 1999). Some examples of safety measures to be enacted at either Site C-1 or in the area west of TA C-53 will be to have flashing warning lights (which would be solar powered) when lasers are being used, warning signs posted around the range, and LDERF personnel acting as spotters to make sure no one comes near the range when it is active (Gorski 2003). In addition, all alternative test range sites would need to be surveyed for specular reflective surfaces. Such objects (i.e., pieces of metal from munitions, soda cans, etc.) would be capable of intercepting laser beams being fired down range, and refracting the light to an undesired area. It is recommended that a sweep for specular reflective surfaces be conducted in conjunction with an EOD sweep for surfaced UXO.

Rocky Bayou Airport

The Rocky Bayou Airport is located south of the proposed LADAR range west of TA C-53. The Rocky Bayou airfield is a small, privately owned airport servicing small private aircraft. The end of the airport runway is located a little under 1.5 mi. south of the 2 km arc of the proposed LADAR range and is approximately 4000 ft. south of the Eglin AFB boundary. Lasers will not be fired to heights above the tree line and the lasers will be very consolidated (as opposed to being diffuse), so only a very small area (less than 1 ft. in diameter) could be impacted at any one time. The lasers will be eye-safe past the southern arc of the 2 km cone.

North-South Corridor and Restricted Corridor 2918

The proposed LDERF and outdoor LADAR range fall within the North-South corridor (Figure 20). The lasers will not be fired at levels above the tree line (30-40 feet in height). The existing LDERF at Site C-3 is also in the North-South corridor, which could cause the LDERF to be evacuated 3-5 times per year for up to four hours at a time. The cone is located adjacent to Restricted Corridor 2918, but does not fall within that corridor. This is a restricted area that schedules both ground missions and can restrict airspace.

3.8 Noise

Impulsive noise associated with munitions, artillery, and high explosives use on TA C-52 is the largest source of noise for either alternative site. There is a potential for negative noise impacts to LDERF personnel especially at Site C-1 from high acoustic overpressures. There is also potential for unfavorable atmospheric conditions to refract and focus sound energy over great distances, should explosive testing take place during times of inclement weather. Sound is

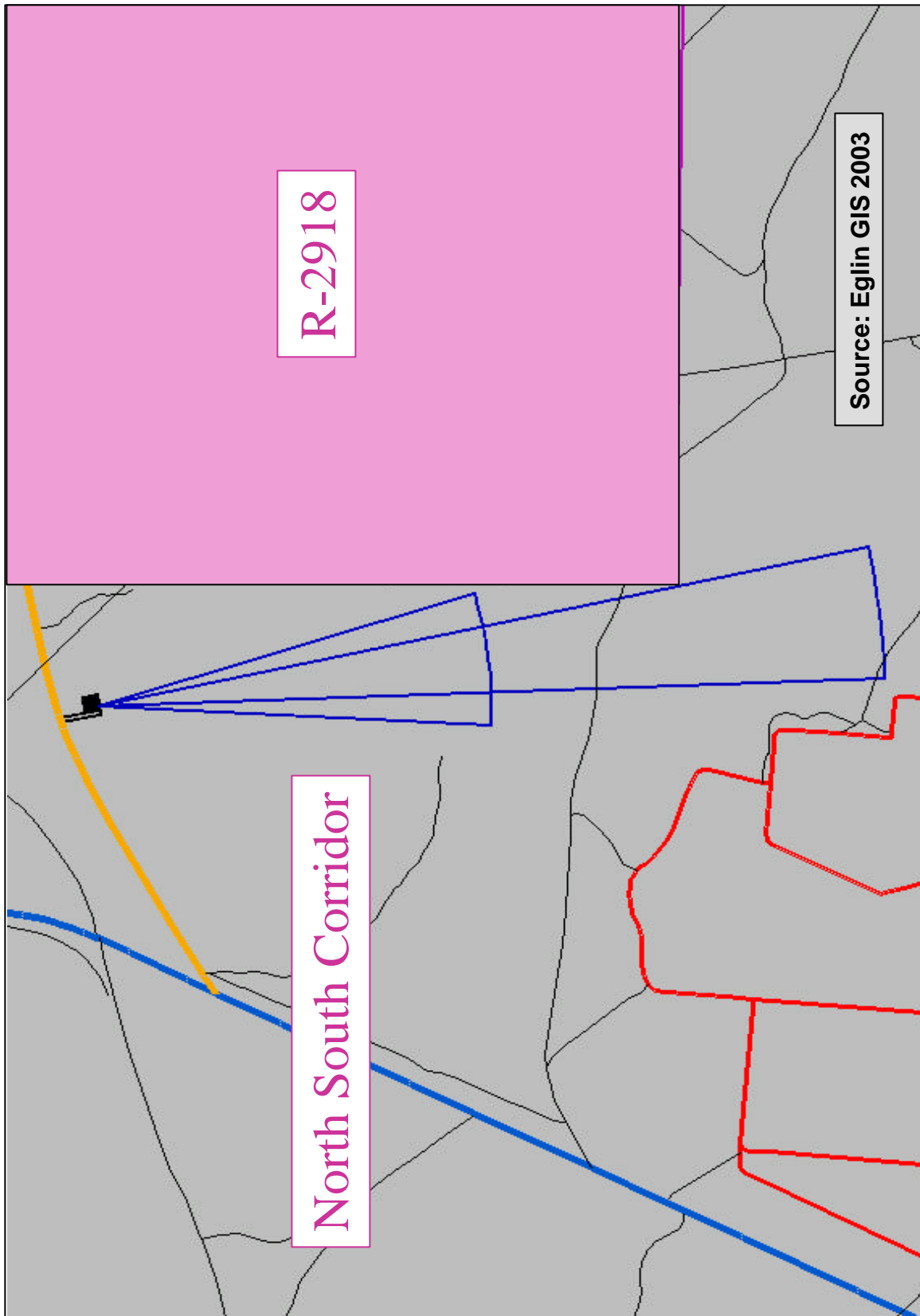


Figure 20. Locations of North-South Corridor and Restricted Corridor 2918 in Relation to LDERF and LADAR Range Locations

measured in decibels, or dB. Noise impacts for TA C-52 are evaluated at the peak decibel level (dBP), which is considered a more accurate measurement of noise. The Air Force accepts a noise threshold of 115 dBP, with levels above having a significant noise effect and below having a moderate risk of noise complaints. Below this 115-dBP threshold, there is almost no evidence of complaints or community action (U.S. Air Force 1999). The Navy and Civil Engineering (CE) EOD carry out many individual detonations on C-52N and C-52 W. Noise thresholds at C-52 W and C-52 N, which result in noise levels above 115 dBP, are 2,500 lbs NEW (Net Explosive Weight) and 3,000 lbs NEW, respectively. Figure 21 depicts noise contours of 2,500 lbs NEW detonations at C-52 W and 3,000 lbs NEW detonations at C-52 N. LDERF operations in the area west of TA C-53 would be exposed to noise levels between 110-115 dBP if 2,500 lbs NEW were detonated at C-52 W. Site C-1 would be exposed to noise at or above the 140-dBP threshold for harm to biological organisms if this level of explosives were detonated at C-52 W. However, all individual items that have been detonated at both C-52 N and C-52 W were below 1,000 lbs NEW (U.S. Air Force 1999). The amount of explosive material detonated by the Navy EOD School and CE EOD were below the 115-dBP-threshold level for annoyance.

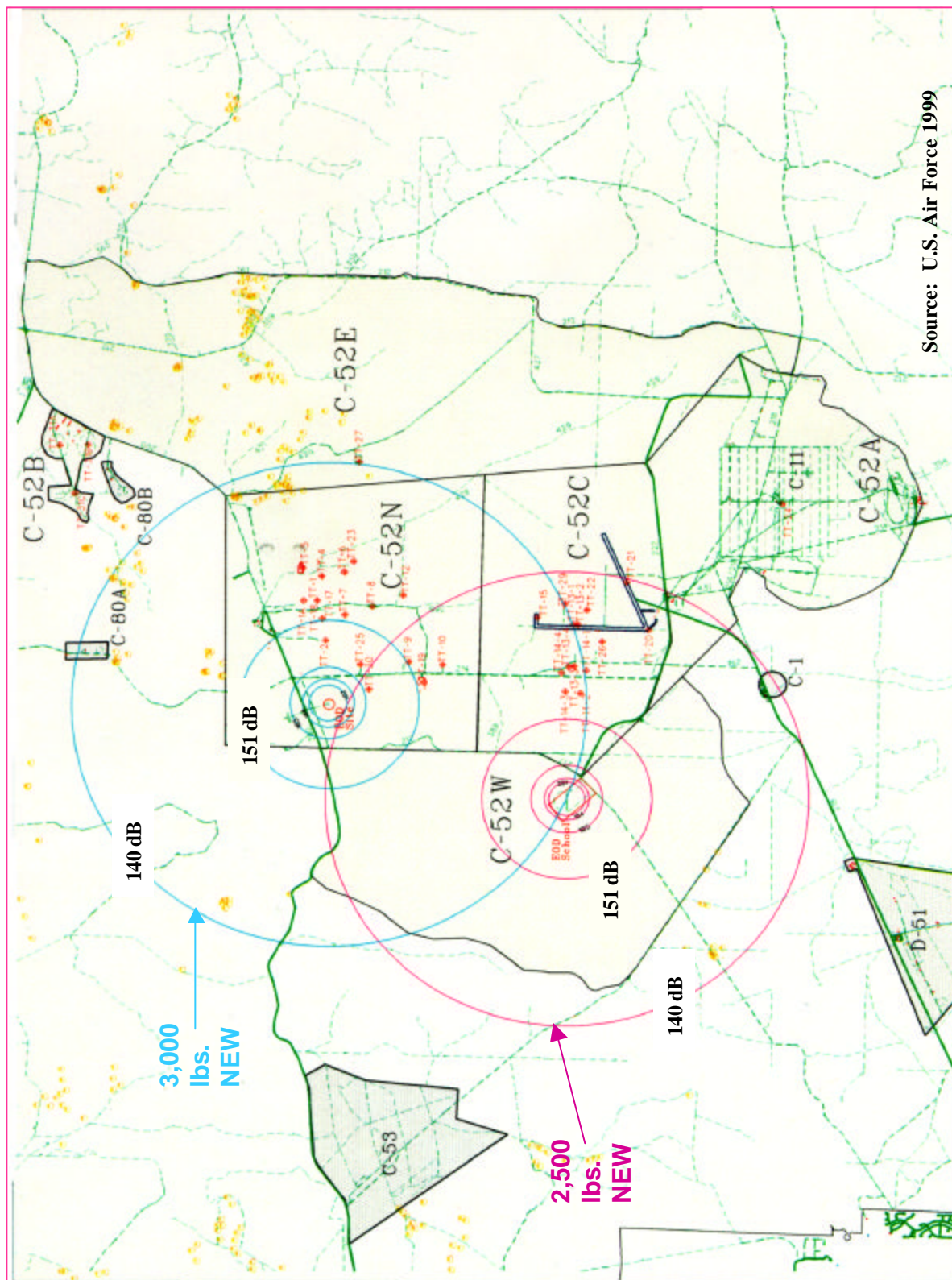
Figure 22 depicts the propagation of noise from a 3,000 lb NEW detonation with no winds and inversions present. If LDERF personnel were outside performing tests at the site west of TA C-53 without wind or inversions, due to the proposed site's distance from TA C-52, they would be exposed to noise levels of between 110 to 115 dBP. Personnel located at Site C-1 would be exposed to noise levels of 120 to 125 dBP (U.S. Air Force 1999).

Noise levels resulting from construction, modification, or operational activities at either alternative site should not exceed 85 dB. Personnel inside the work area would be required to use hearing protection equipment if the noise levels from testing or other activities exceeded 85 dB over an eight-hour period. However, it is not projected that interior noise levels would reach or exceed this level.

3.9 Air Quality

Although mission activities at Eglin result in certain volumes of air emissions, the regional air quality is good, attaining both federal and state standards. Eglin AFB is located in a Class 5 Air Quality Containment Region (AQCR) (U.S. Air Force 1995). The Clean Air Act (CAA) established national standards, National Ambient Air Quality Standards (NAAQS), for air quality in terms of concentrations of designated pollutants. Air quality is described as a concentration, usually in parts per million (ppm). These standards are achieved by states through the development of State Implementation Plans (SIPs). The six pollutants that comprise NAAQS are sulfur oxides (SO_x), particulate matter with a diameter less than/equal to 10 microns (PM₁₀), carbon monoxide (CO), ozone (O₃), nitrogen oxides (NO_x), and lead (Pb) (Bowman 1998).

The input of air emissions from land areas within Santa Rosa, Okaloosa, Walton, Escambia, and Gulf counties is small due to the lack of heavy industry. At Eglin, air pollutants are emitted from various mobile and stationary sources, ranging from use of government-owned vehicles and aircraft operations, to prescribed burning and open burning/open detonation of UXO (U.S. Air Force 1999). Eglin AFB is located in an attainment area, which is described as having moderate industrial growth and has the potential to emit levels that exceed 100 tons/year. Eglin AFB is



Source: U.S. Air Force 1999

Figure 21. Noise Propagation Contours for 2,500 lbs. NEW at C-52 W and 3,000 lbs. NEW at C-52 N

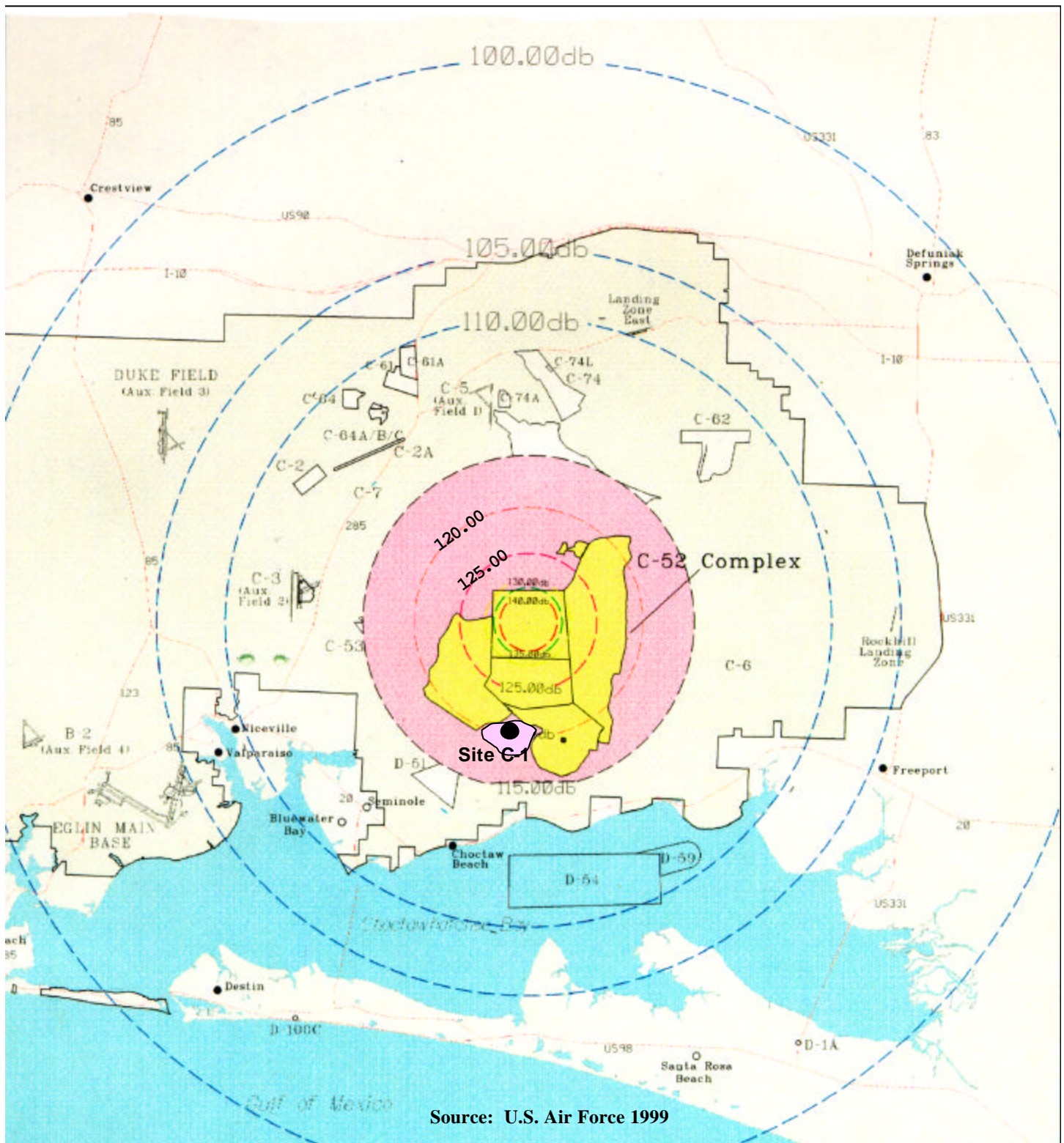


Figure 22. Noise Propagation from a Detonation of 3,000 pounds NEW During Favorable Weather Conditions

also considered a major source for Hazardous Air Pollutants (HAPs) since the base has the potential to emit HAPs at an annual rate of 25 tons/year (Eglin AFB 1999).

3.9.1 Area West of TA C-53

As described in Section 3.4.1, the main hazardous materials process at present and at any future site will be a small cleaning process for circuit boards. This process is officially classified as an electroplating process, and has an AQUIS ID #3077 (Fortenberry 2003). This process uses a 3.5% sulfuric acid solution with a small concentration of copper to bond to metal elements on the circuit board. This operation currently takes place outdoors, but will likely be moved to a well-ventilated area in the new facility. The circuit board cleaning apparatus consists of two side-by-side tubs, which are secondarily contained by additional tubs. The entire apparatus is also located in a bermed area (Fortenberry 2003). An additional air source is a Honda 6.7 HP portable generator for emergency use. It is estimate that the generator requirement will double for the new LDERF site. The new LDERF buildings will use electric to power a central heating and air conditioning system and for water heating purposes. Thus, a boiler will not be used at the proposed new LDERF site.

3.9.2 Site C-1

Stationary air emission sources at Site C-1 include two, 1000-gal diesel tanks used to operate boilers that provide comfort heating and hot water to Building 8777. Both tanks are operational and have current Air Quality Utility Information System (AQUIS) identification numbers. Should the ownership of the tanks transfer to AFRL/MN, these tanks would be added to the AFRL/MN monthly air monitoring report. Air emissions from these two sources are minimal when compared to emissions in Okaloosa County, and continued use would not warrant change to the current Title V air permit (Garrison 1999). Both tanks should operate at 35% efficiency over a five-month period each year (Carman 1999).

3.10 Socioeconomics and Aesthetics

Socioeconomic impacts resulting from the implementation of any action alternative would be minimal. If all material and labor required for the modification of Building 8777 and clear-cut of a 15-degree, 1000 meter LADAR test range were taken from the local area, revenue generated would be minimal. Likewise, the cost of construction of an LDERF and a 117-acre outdoor LADAR range would have minimal impact to the local economy. Since the most probable action alternatives take place off Site C-3 (the present LDERF location), personnel would be relocated. Site C-1 is roughly 14 miles from the Valparaiso gate, compared to roughly 10 miles from Site C-3. The proposed LDERF site west of TA C-53 is only one mile south of Site C-3.

Aesthetics at both action alternative sites would be affected. For the area west of TA C-53, two buildings would be visible on previously undeveloped area. In addition, 117 acres would be clear-cut, and this may decrease the aesthetics in this area. For Site C-1, although the proposed modification would improve the aesthetics of Building 8777, the proposed clear-cut of 40 acres of timber may decrease the aesthetics in this area. Both clear-cut alternatives are sparsely

forested areas, where the area around C-1 comprised mostly of low quality sand pine. Most of the trees standing in the area west of TA C-53 are oak or long leaf pine.

3.11 Land Use

3.11.1 Area West of TA C-53

Jackson Guard was consulted to determine the present land use designation of the preferred site alternative west of TA C-53. According to Jackson Guard recreational maps (Figure 23), the proposed LDERF/LADAR range are located within a current hunting area, Management Unit #10. This area is primarily used for general hunting, archery, small game hunting, and is used during turkey season. Dog hunting is also approved in this area during general gun season and small game season. There is also bird dog training year round. In order to change the land use designation of this area, the Eglin Outdoor Activity Committee (OAC), chaired by the 96 Air Base Wing Commander, must approve the change. Then base and recreation maps would be changed to reflect the new land use designation (Figure 24). Once an area is closed to the public, should any person(s) choose to hunt in this area, such activity would be considered illegal trespassing in a closed test area (Johnson 2003).

3.11.2 Site C-1

The official land use designation for Site C-1 is Industrial. Thus, this proposed land use would be compatible with the existing land use patterns associated with the Eglin Land Use Plan component of the Base Comprehensive Plan. The proposed action would comply with the *Planning and Programming of Facility Construction Projects*, AFI 32-1021, and the Installation Development Committee's recommendations (Sanchez 1999). This project would require site plan approval from the Facilities Board. According to the *Air Force Real Property Category Code Descriptions*, Building 8777 at Site C-1 is currently coded 390-311, or an Electronic Research Radar Facility. Such a facility is coded for design, square feet/square meter (SF/SM) development and evaluations accomplished on electromagnetic antennas, electronic measurement devices, and radio frequency (RF) systems including filters and antennas for land and airborne instrumentation systems. The proposed transfer of LADAR operations to this site will not change Building 8777's facility code (U.S. Air Force 1999a). This area is currently restricted, and no forms of recreation take place in this area (Figure 25).

3.12 Mission Conflicts

3.12.1 Site C-3

The LDERF facility is currently co-located with the Base Installation and Security System (BISS) at Site C-3. Site C-3 is owned by the 46 TW and is maintained by BAE Systems. Since September 11, 2001, the BISS mission has rapidly expanded and scheduling conflicts have led to the closure of the 700-meter outdoor LADAR range at Site C-3 (Gorski 2003). A temporary LADAR range has been established at C-3, but due to scheduling and logistical difficulties, it has been used in one operational test since it was established in 2002. In addition to mission conflicts on Site C-3, the current LDERF facility is also located in the bomb-drop corridor for

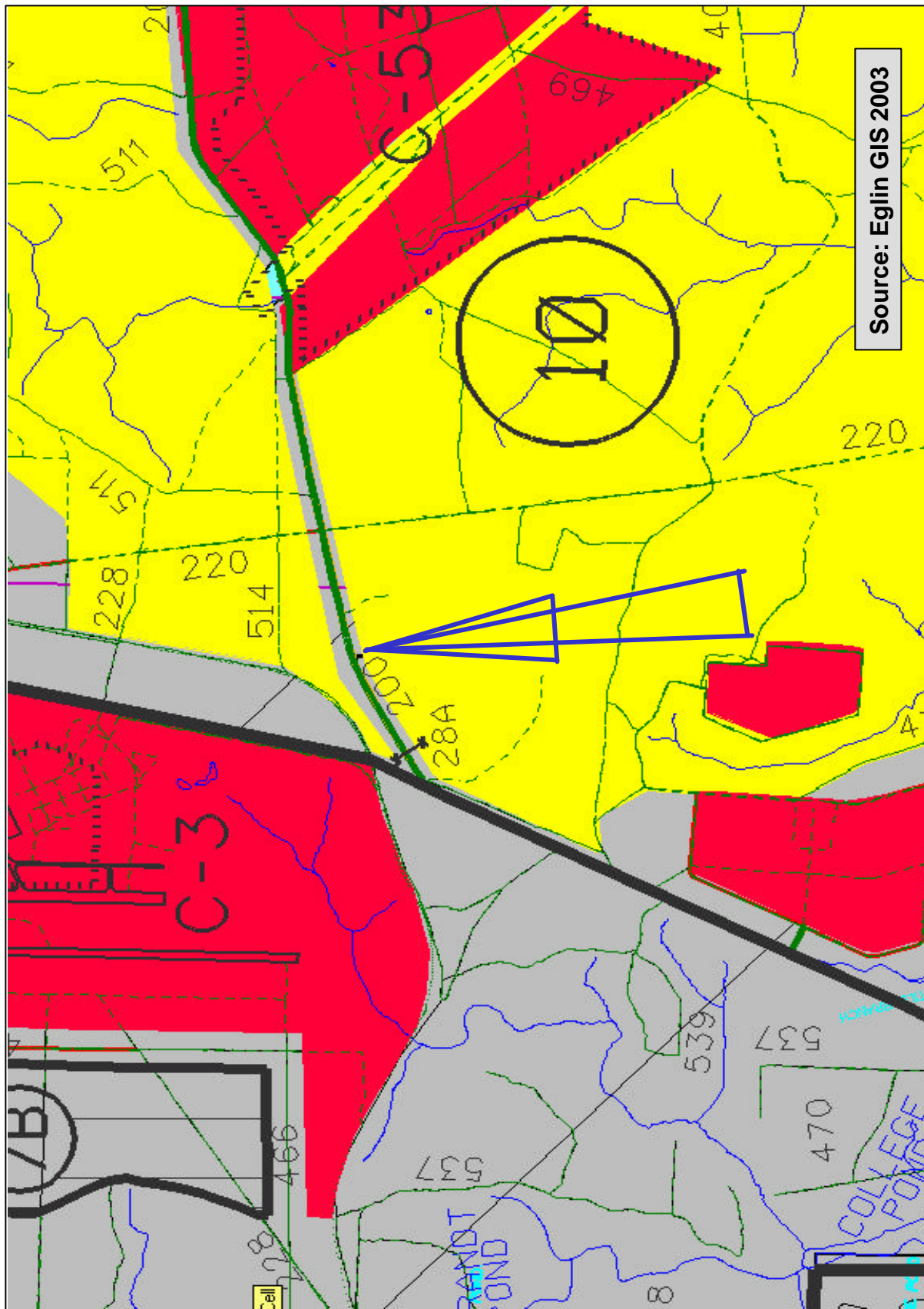


Figure 23. Management Area #10 in Relation to Proposed LADAR Test Range

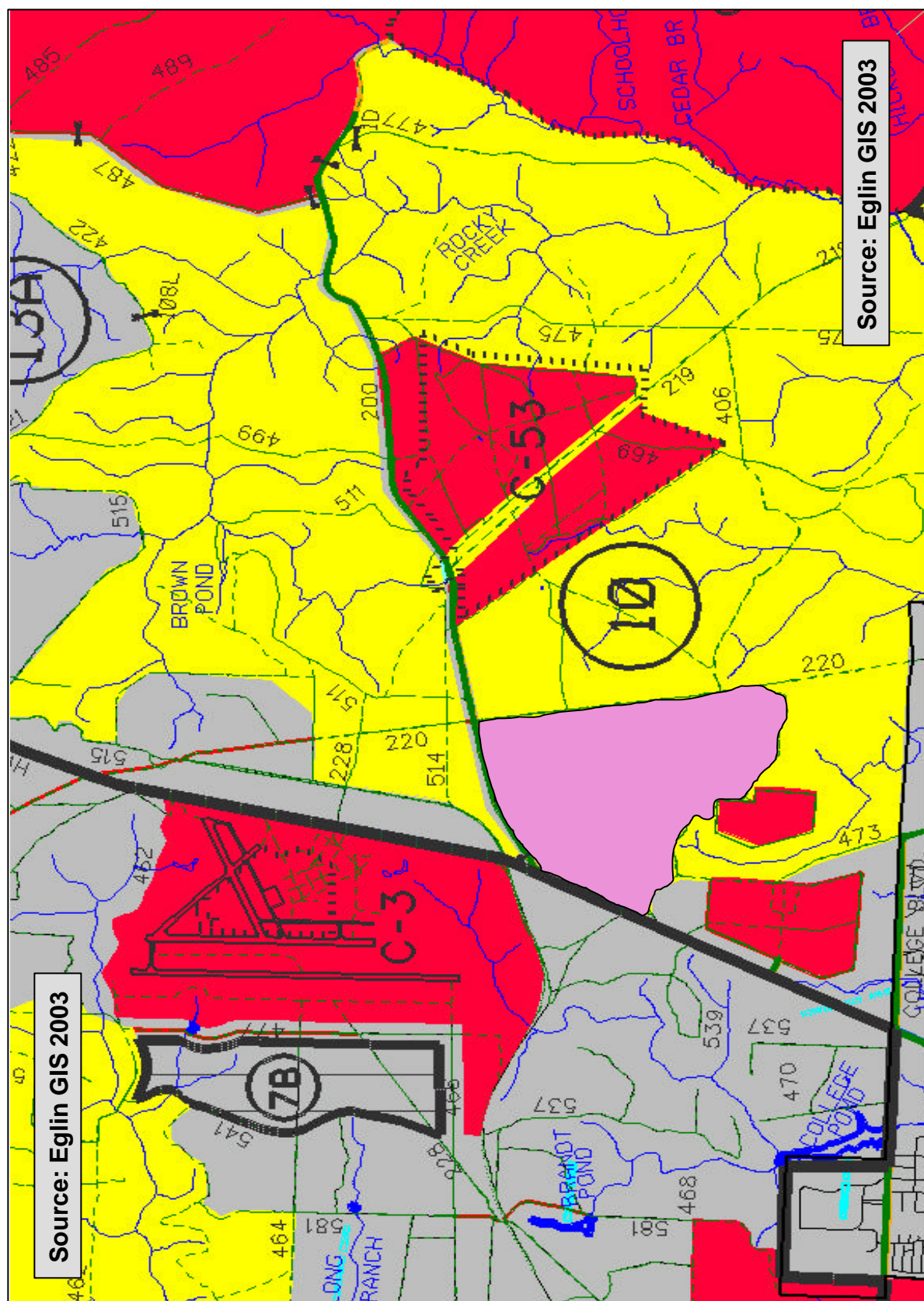


Figure 24. Proposed Restricted Area (Safety Footprint) Within Management Area #10

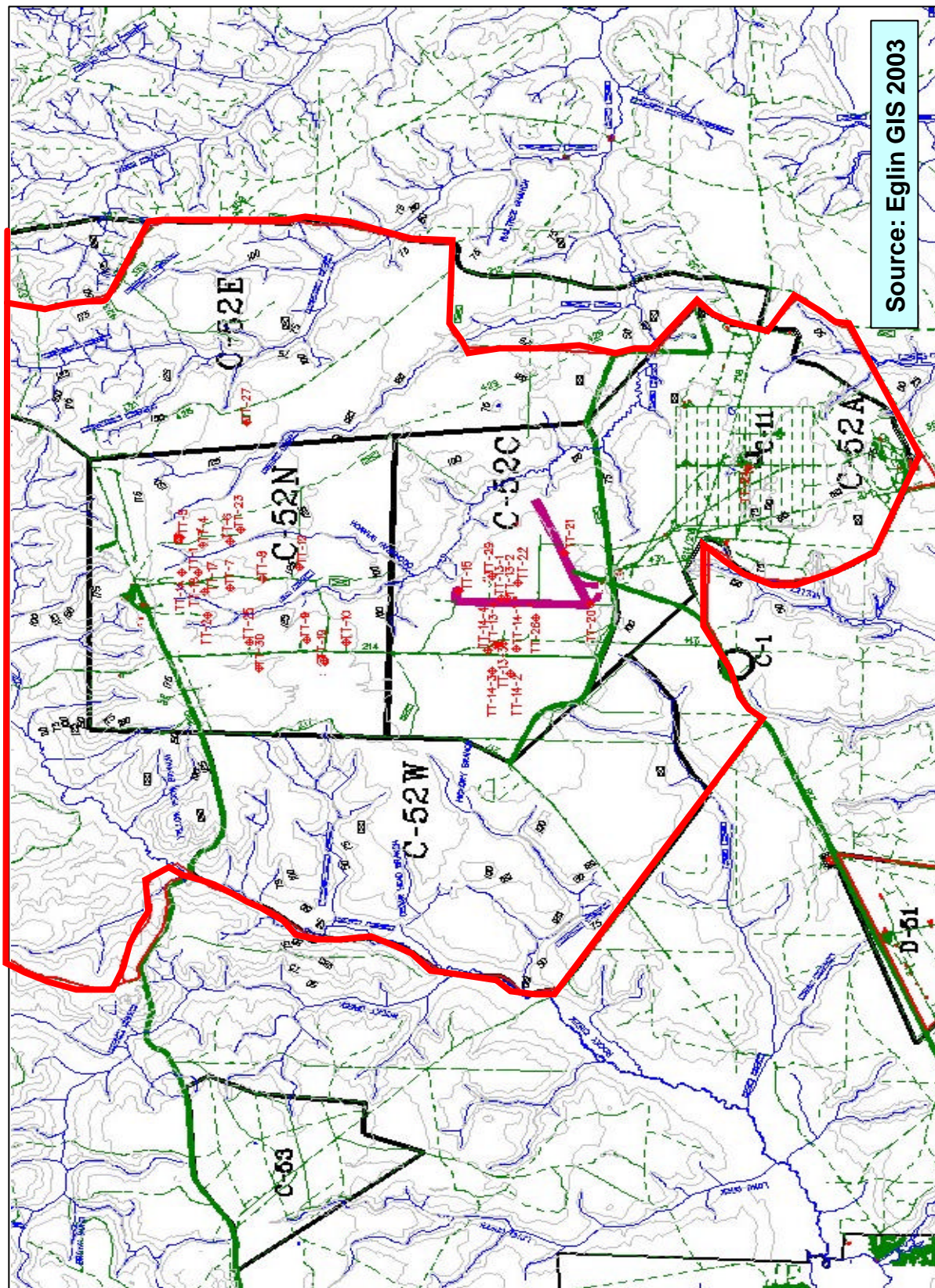


Figure 25. Areas Restricted from Recreation Near TA C-52 (Including Site C-1)

Range B-70. During such tests, which take place 4 to 5 times a year, the LDERF facility is evacuated for roughly 2 to 3 hours (Gorski 2003).

3.12.2 Site C-1

Although Site C-1 exists roughly 2 miles from the southern tip of C-52W and 3.5 miles from the center of C-52 W, there is a potential for footprints of certain tests to include the location of Site C-1. Although there is a potential for several mission conflicts with TA C-52, historically there have been few site evacuations per year (Miller 2000). When Site C-1 functioned as a Chemical/Biological laboratory and later as a Radar Laboratory, there were no more than 1 to 2 mission conflicts per year. During a TA C-52 mission, where Site C-1 would be located in the footprint, personnel were usually asked to remain indoors, or had to evacuate the building. When evacuations were necessary, the time away from Site C-1 lasted between 1.5 to 2 hours (Miller 2000).

However, according to 46 OSS, the 46 TW Range Scheduling office, the footprint for Mk-82's used in the Navy COM2EX and JTFEX training would likely overlap Site C-1. Since the Navy may start conducting these tests permanently at Eglin AFB, this training may cause evacuations twice a year (spring and fall) (Miller 2000). Thus, normal C-52 activities plus the increased U.S. Navy mission would most likely result in roughly 4 scheduling conflicts that could result in Site C-1 evacuation.

3.12.3 Area West of TA C-53

The only mission that could potentially conflict with LDERF operations is Hellfire testing that takes place at TA C-72. It has been determined by the 46TW that such missions could occur 4-5 times a year, resulting in the evacuation of the LDERF personnel.

4.0 ENVIRONMENTAL CONSEQUENCES

This chapter analyzes the potential environmental impacts of the five alternatives described in Chapter 2 on selected environmental receptors. This chapter is organized by alternatives; environmental receptors (issues) will be discussed in the same sequence as in Chapter 3.

4.1 Effects of Alternative 1—No Action Alternative

Under this alternative, not transferring LDERF operations to Site C-1 or constructing an addition to Building 2067 at Site C-3, would maintain the status quo.

4.1.1 Biological Resources

There would be no biological resources impacts associated with the “no action” alternative. A highly compromised, low-value range area would persist.

4.1.2 Water Resources

There would be no adverse impacts to water resources associated with the “no action” alternative. Site C-3 would continue to be outside a floodplain area, and water resources (surface water, groundwater) would not be adversely affected by present range use. There would be no impacts to wetlands, since no wetlands are located in the immediate area.

4.1.3 Hazardous Materials/Hazardous Waste

There would be no adverse impacts to LBP and ACM, due to their lack of existence at the current LDERF facility. Hazardous materials usage (in the form of restricted hazardous materials kits) would continue to be strictly controlled by the AFRL Environmental Team (AFRL/MNMI).

4.1.4 Cultural Resources

There would be no impacts to cultural artifacts or historic sites due to continued operations at the LDERF facility. Test Area C-3 contains no cultural resources or sites eligible for the National Register. Furthermore, no such resources exist within one-half mile of the test area (U.S. Air Force 1995).

4.1.5 Safety/Occupational Health

Safety concerns associated with the testing of non-eye safe lasers would remain at Site C-3. Signs indicating the use of lasers would remain on the perimeter of the range, and red-flashing lights would continue to operate during laser testing events.

4.1.6 Noise

There would be no adverse noise impacts due to current range operations at Site C-3.

4.1.7 Air Quality

Air pollution levels would not be impacted from the continuation of current LDERF operations.

4.1.8 Land Use

The land use designation would not be impacted by this alternative and Site C-1 would remain as an Industrial site. The facility would remain an Electrical Research Radar Laboratory.

4.1.9 Mission Conflicts

Mission conflicts with the BISS operations at Site C-3, during which outdoor LADAR tests cannot be performed, would continue. In addition, the current LDERF facility is also located in the bomb-drop corridor for Range B-70. During such tests, which take place 4 to 5 times a year, the LDERF facility is evacuated for roughly 2 to 3 hours (Gorski 2003).

4.2 Effects of Alternative 2—Construct a New LDERF and Establish an Outdoor LADAR Range West of Test Area C-53 (Preferred Alternative)

4.2.1 Biological Resources

This preferred action would involve clearing a 117-acre cone of trees in a forested area south of Range Road 200 and west of Range Road 220 (Figure 2). This is a sparsely forested area that was cleared of all trees except for long leaf pine and oak as part of a long leaf pine restoration project. Although the proposed action would eliminate a portion of habitat area for certain species, there are areas adjacent to the proposed range that could be used for habitat and foraging. The cleared area should not change the migration or feeding patterns of animal species in the area. The cleared area may attract more wildlife to graze. However, this area will soon be restricted from hunting, which would mitigate the decrease in cover for the wildlife moving through the cleared area.

The existing long leaf pine can be classified as merchantable timber, thus the sale of the clear-cut lumber would generate revenue for the base. Tree removal will require consultation and approval from Mr. Scott Hassel at Jackson Guard, AAC/EMSN, before any trees are cut and removed. A contractor would pay Jackson Guard to clear the trees, which would be removed by selective clear cutting. The contractor would only remove the usable, merchantable timber. Either Civil Engineering or a contractor would perform the clearing of the woody (live oaks) and herbaceous understory (Ironside 2000).

The preferred action would cause no adverse impacts to threatened and endangered species. The closest marked RCW trees (95 and 185 feet outside the cone perimeter) are inactive and fall outside the boundary of activity for this proposed action (Figure 12). Based on a site visit on 16 April 2003, this area was determined not to be a critical habitat or foraging area for RCW. Thus, the proposed establishment of a LDERF site and LADAR test range would have no adverse impact on the RCW.

No gopher tortoise burrows were found on the site, but if tortoise burrows were detected in the future, Jackson Guard (AAC/EMSN) would be notified immediately. Okaloosa Darters can be found in the headwaters of Turkey Bolton and Long Creeks, located approximately 1322 feet west of the range perimeter, and 2099 and 2877 feet east of the range perimeter (Figure 15). Due to the distance from the stream and relatively flat slope of the area, the establishment of the range would have no adverse effect on the Okaloosa Darter.

4.2.2 Water Resources

Construction of a LDERF Site

The creation of an outdoor LDERF site would create new impervious surfaces where none previously existed. According to the proponent, roughly 25,270 ft² of impervious surface would be created. This includes the building footprint, access road, parking lot, walkways, and a concrete pad. In order to mitigate any storm water effects, a swale system would be constructed down slope and adjacent to the LDERF site to catch storm water runoff. These swales would be designed and constructed to comply with the physical and functional requirements outlined in 62-25 FAC. The proponent would ensure that the water quality management team in AAC/EMCE is consulted prior to the final implementation of the design. Due to the incorporation of a storm water management system and the small area of impervious surface that will be created, there are no negative environmental impacts anticipated.

Preparation of the immediate site surrounding the LDERF will consist of cutting and uprooting trees and grading of the site to allow for paving and building construction. The effect of disturbed area on water resources must also be considered. Since the disturbed area may meet or exceed one acre, the proponent may need to apply for a NPDES permit. The proponent will work with AAC/EMCE and the building contractor to ensure that during construction, erosion control structures and other construction best management practices will be used to minimize eroded soil from impacting local water bodies. Such practices would include silt fences and hay bales around the site, frequent site inspections, and laying sod on site post-construction. Given the effort to minimize the area disturbed, the use of erosion control structures, inspection of structures for failure, and site vegetation post-construction, there are no negative environmental impacts anticipated.

Water consumption at the site will consist of water for drinking and sanitary use. A well, which will be installed by a licensed well driller, will be established at this site to provide water for drinking and for toilets. CE will need to determine the water requirements for fire suppression (if any). The well water will not be used for any irrigation. Water supplied to flush toilets will be held in a septic tank until it is released through an adjacent leach field. The proponent will be required to apply for a consumptive use permit. Since the facility is committed to keeping water usage to within the limits of their consumptive use permit, there are no negative environmental impacts anticipated.

Establishment of an Outdoor LADAR Range

The establishment of an outdoor LADAR test range would not have an adverse impact on water resources, including surface water, ground water, and wetlands. First, although the area will be clear-cut, unlike the area around the LDERF site, tree stumps will not be removed nor will the range area be graded. Thus, the likelihood of eroded soil moving via overland sheet flow to receiving water bodies will be low.

The location of the LADAR test range would also not make it susceptible to 100-year flood events. According to FEMA 100-year floodplain maps, the proposed LADAR test range would not be susceptible to such flooding events (Eglin GIS 2003). Eglin GIS 5-foot contour maps corroborated these data by showing the elevation of the proposed LADAR test range to be approximately 30-35 feet above the elevation of Long Creek and Turkey Bolton Creek. Also, according to Figure 15, the range perimeter is also far away from those streams' headwaters. Thus, considering the steep slope upward from the creek and distance from the creek to the test range, there are no floodplain concerns associated with the proposed action.

There are small wetland areas, associated with streams, which exist outside the proposed LADAR test range perimeter. Titi, sweet bay, and blue maiden cane exist at a small spring-fed marsh forming the headwaters of a branch of Long Creek (Figure 15 point I). In comparison, points F, G, and J in Figure 15 represent very narrow, high-slope areas. The narrowness of these wetlands is due to the immediate steep increase in slope from the creek bank. The proposed establishment of a LADAR test range would not intersect any jurisdictional wetlands. Thus, acquiring an Army Corps of Engineers Section 404 Dredge and Fill permit would not be necessary. As is the case with distance to streams, since the LADAR range perimeter is far away from each of the wetland areas as shown on Figure 15 and there will be minimal disturbance of range soils, there are no anticipated negative effects due to this action.

Impacts of disturbed soil degrading habitats that support sensitive species are of chief concern. According to Figure 12, the endangered Okaloosa Darter can be found in the headwaters of Long Creek and Turkey Bolton Creek. Sediment loads could increase turbidity and compromise the integrity of the stream, thus posing an adverse impact to the Okaloosa Darter. In order to prevent possible negative or deleterious effects to the Okaloosa Darter, the range area will not be clear cut, have stumps removed, and will not be re-graded. The soil will remain stabilized, and will not be prone to erode. Should soil become disturbed in some areas, those areas will become re-vegetated with seed or sod. Thus, there are no anticipated impacts to the streams that serve as habitat for the Okaloosa Darter.

4.2.3 Hazardous Materials/Hazardous Waste

There are no hazardous materials/hazardous waste issues associated with this action. This alternative would not introduce new hazardous materials to the site, except for a woody herbicide like Garlon 4 that could be used to treat woody emergent growth. This herbicide could potentially be used as an alternative to mechanical cutting/maintenance of emergent vegetation. Hazardous materials processes (such as the small plating process) would remain the same. Hazardous materials usage (in the form of restricted hazardous materials kits) would continue to

be strictly controlled by the AFRL Environmental Team (AFRL/MNMI). Construction workers and existing personnel would not be exposed to ACM or LBP. No IRP sites are located in the immediate area. The closest IRP sites to the preferred site west of TA C-53 are listed in Tables 3.3 and 3.4 in Chapter 3, Affected Environment.

4.2.4 Cultural Resources

There would be no impacts to cultural artifacts or historic sites due to the construction of an LDERF facility or outdoor LADAR test range west of TA C-53. Neither the LDERF site nor the proposed LADAR range areas contain cultural resources or National Register eligibility sites. The perimeter of the LADAR range cone falls outside the 200 m zone surrounding streams where cultural resources sites are more likely to be found. EMH personnel conducted a pedestrian survey of the area and cited no concerns with the preferred action site (Shreve 2003).

4.2.5 Safety/Occupational Health

UXO Concerns

The establishment of an outdoor LADAR testing range should not have an adverse impact on safety and occupational health providing certain precautions are taken. Historically, TA C-52 has been very active in explosive ordnance testing and has a high probability for the existence of surface and subsurface UXO. Figure 19 indicates areas around TA C-52 that are considered a high probability area for UXO. Although the area west of TA C-53 exists on the outer boundary of the UXO contamination zone, the extent of that contamination has not been determined. Thus, the Eglin AFB Range Safety office, AAC/SEU, would require the Air Force EOD group to perform a thorough ground sweep of the proposed LADAR range. The amount of contamination will determine if either the range can be cleared or if the site is too contaminated for a timely occupation.

A UXO sweep by Eglin AFB EOD personnel would first consist of an initial walk through of the area to be cleared for the LADAR test range. The 117-acre area would be divided into a grid, and EOD personnel would visually scan the range for surface UXO. Since lasers will also be fired on this range, safety would need to ensure that the range is cleared of all specular reflective surfaces. EOD personnel would also check trees for signs of disfigurement and damage from contact with bullets and other classes of munitions. If subsurface contamination is anticipated, the EOD team will use the Ferex[®], a subsurface ferrous ordnance detector, to mark the location of underground UXO. EOD personnel then have three options:

Dig down to the ordnance, and if inert, take it away

Dig down to the ordnance, and if live, detonate it on site

Perform a remote excavation and then either take inert ordnance off-site or detonate on-site (Singleton 1999)

If UXO were found, they would be handled in accordance with established EOD practices. Most likely the UXO would be open detonated in place or moved to a range approved for safe open

detonation. If the EOD would like to take the UXO off-site for further examination and/or testing, it would be addressed as hazardous waste under the Military Munitions Rule (MMR) of 1997, and all clearance and disposal activities would be subject to the MMR (Robeen 2003).

Radiation Safety

Since non-eye safe lasers would be tested on the proposed LADAR range, non-ionizing radiation concerns would exist in the area west of TA C-53. Lasers tested on this range would be non-eye safe up to roughly 700 meters (Gorski 2003), which would extend the length of the 2 km test range. Persons that directly viewed the laser from beyond this point would be in an eye-safe region. Persons viewing the range perpendicular to the path of the laser beam would not be affected by the laser (Gorski 2003). The laser that is used in testing is not diffuse, but is a concentrated beam, likened to a soda straw passing through space. Thus, in a three-dimensional area, the laser would occupy only a small, tube-shaped volume. Also, the lasers will not extend in elevation above the tree line (30-40 feet), thus would not pose a problem to aircraft flying over the area.

There is a current Laser Safety Operating Instruction (OI) for LDERF and LADAR range operations. This OI is site specific and must be approved by the Eglin AFB Radiation Safety Officer (RSO). The OI would highlight steps to ensure the safety of authorized and unauthorized personnel. The same safety practices currently implemented at Site C-3 would be practiced in the preferred action location. Since there will not be a chain-linked fence around the range perimeter, a safety footprint around the range cone will be devised. This will be enacted to minimize the likelihood that hunters would cross onto the range during a laser event. Most likely this safety perimeter will follow natural geographic markers such as roads or streams. In this case, it would be recommended that the area between State Route 285 and Range Road 220 be the western and eastern boundaries of this new restricted area. Range Road 200 and an unmarked road directly north of the spray fields (south of the range cone) would represent the northern and southern boundaries, respectively (Johnson 2003). Gates could be placed on Range Road 406 on either side of the range perimeter to further deter vehicles from moving through the closed area.

Some examples of safety measures that would be practiced in the area west of TA C-53 will be to have flashing warning lights (which would be solar powered) when lasers are being used, warning signs posted around the range, and LDERF personnel acting as spotters to make sure no one comes near to the range when it is active (Gorski 2003). Range spotters would be posted at various stations around the range and equipped with binoculars. Should a person be spotted anywhere near the test range when the laser becomes active, the control desk will be notified via radio and the laser will be shut down. Thus, given the implementation of a safety perimeter and regular safety practices that would be implemented during laser tests, the likelihood of this action having a negative effect on personnel or public safety is small and manageable.

4.2.6 Noise

LDERF Site Construction

Interior operations inside the new LDERF would not generate noise levels exceeding 85 dB. During construction of the site, construction workers would be required to use hearing protection equipment in accordance with the Occupational Safety and Health Administration (OSHA) regulations, if construction noise levels exceeded 85 dB over an eight-hour period. Noise impacts to indoor LDERF operations from activities that take place at TA C-52 will be discussed below, under *Establishment of an Outdoor LADAR Test Range*.

Establishment of a Northwest-Bearing Outdoor LADAR Range

Although outdoor LADAR testing should not generate noise levels exceeding 85 dB, activities on Test Area C-52 (i.e., EOD operations) could cause noise levels at the new LDERF site to exceed 85 dB. The Navy and CE EOD detonate many items on C-52N and C-52W. The new LDERF site and outdoor LADAR range would be outside the 140 dBP contour resulting from detonations of 2,500 and 3,000 NEW bombs at Ranges C-52 W and C-52 N, respectively (Figure 21). Noise resulting from testing of Mk-83 1,000-lb class weapons at C-52 N during good weather conditions would produce noise levels under 115 dBP at the new LDERF site (Figure 22). Although tests performed during unfavorable weather conditions can cause unfavorable noise levels, detonations under such conditions are usually avoided (U.S. Air Force 1999). Given that noise levels from C-52 will be below the threshold for annoyance and that LDERF personnel will either use hearing protection for noise above 85 dBP or be evacuated, no adverse impacts due to noise are anticipated. Also, activities at the LDERF and outdoor LADAR range will not cause noise above 85 dB.

4.2.7 Air Quality

This preferred action would not have an adverse impact on air quality. Any emissions from trucks and heavy machinery used for construction would be minimal and temporary. Fugitive dust particles would be generated, but this phenomenon would be temporary and would have no lasting adverse effects. Title V emission sources, such as oil tanks to fuel boilers, would not be added as part of the proposed action. Existing 6.7 HP generators would continue to be used and larger generators may be purchased to accommodate a larger facility. However, all generators used would have AQUIS ID numbers and would be monitored as part of the AFRL monthly monitoring of Title V air emissions sources.

The establishment of an outdoor LADAR test range would not cause any adverse impacts to ambient air quality. The proposed action would not create any new Title V emissions sources.

4.2.8 Land Use

The current land use designation for the proposed LDERF site and outdoor LADAR test range is recreational/natural. The area is designated by Jackson Guard as Management Unit #10, and is used for general hunting, dog hunting, archery, small game hunting, and is used during turkey

season. Figure 23 depicts the location of the cone inside Management Unit #10. Figure 24 depicts the area, including the LDERF site, the outdoor LADAR range, and a safety footprint, that would now be restricted from recreational use and designated as a test site. This action would reduce the area available for recreation (by roughly 785 acres), but since most of Management Unit #10 would remain open for recreation, no adverse impacts are anticipated.

4.2.9 Mission Conflicts

Given the distance of the proposed LDERF site and outdoor LADAR range to the Rocky Bayou Airport and that no safety issues are anticipated, the presence of the airport will not conflict with the LDERF mission. Nor will the FAA corridor that exists over the proposed LADAR test range conflict with the LDERF mission, due to the fact that the lasers will not extend above the tree line. LDERF operations could be shut down due to Hellfire missions at C-72. This is not anticipated to take place more than 5 times per year. Since such downtime would happen infrequently and is not anticipated to last longer than one day for each test event, this mission conflict is considered minimal.

4.3 Effects of Alternative 3—Construct Addition to Current LADAR Facility, Site C-3

4.3.1 Biological Resources

The construction of an addition to Building 2067 would pose no adverse impacts to biological resources, including endangered species and critical habitats. Site C-3 is a highly disturbed area with low ecological value. No trees and vegetation are present, with the exception of native range grasses.

The alternative action will pose no adverse impacts to threatened and endangered species. There is a potential for the occurrence of gopher tortoises in this area, but a survey conducted by Jackson Guard (AAC/EMSN) determined that no tortoise burrows are present on site (Ironsides 1999). This site is also located outside a RCW foraging area, due to lack of suitable habitat for the species (Ironsides 1999).

4.3.2 Water Resources

The alternative action site does not exist in a 100-year floodplain zone. There are no wetlands or streams near the alternative construction site, or within the range perimeter. The closest stream exists north of the runway, outside the northern perimeter of Site C-3. The alternative action would not breach the soil/groundwater interface. A shallow excavation may be required for the construction of the foundation, but this would not be deep enough to impact the saturated zone.

The alternative action would create roughly 7,100 ft² of impervious surface. The proposed addition would be partially built on an existing remnant of an old landing strip, thus the amount of *net* impervious surface would not be as much as 7,100 ft². Additional storm water discharges must comply with the National Pollutant Discharge Elimination System (NPDES) permit for Eglin AFB. Chapter 62-25, FAC, also requires that any new storm water structure must apply for a construction permit, submit a Notice of Intent (NOI) to use a General Permit for storm

water discharge structure construction, or obtain an exemption. This action would be exempted from the General Permit, due to plans for a storm water treatment structure (swales) to treat the storm water on-site (Robeen 1999). Mr. Dan Robeen, AAC/EMCE, must approve the final treatment structure design.

4.3.3 Hazardous Materials/Hazardous Waste

The alternative action would not adversely impact hazardous materials/hazardous wastes at Site C-3. This action would not introduce new hazardous materials (including petroleum, oils, and lubricants (POL)) to the site. Hazardous materials usage (in the form of restricted hazardous materials kits) would continue to be strictly controlled by the AFRL Environmental Team (AFRL/MNMI). Construction workers and existing personnel would not be exposed to ACM or LBP. No IRP sites are located in the immediate area. Three sites exist beyond the perimeter of Range C-3, but would be beyond the influence of the alternative action. These sites include: LF-10 (north of the range), POI-354, 356 (east of the range), and FT-87 (south of the range).

4.3.4 Cultural Resources

There would be no impacts to cultural artifacts or historic sites due to the construction of an addition at the LDERF facility. Test Area C-3 contains no cultural resources or National Register eligibility sites. Furthermore, no such resources exist within one-half mile of the test area (U.S. Air Force 1995).

4.3.5 Safety/Occupational Health

The alternative action would not have an adverse impact on safety. Safety concerns associated with the testing of non-eye safe lasers would remain at the site. Signs indicating the use of lasers would remain on the perimeter, and red-flashing lights would continue to operate during laser testing events. According to Eglin AFB GIS coverages, the entire area at Range C-3 would not be considered probable UXO contamination area. However, some small, bomb-like spheres were found in the area around the LDERF facility in July 1999, and were originally suspected to be UXO. Interviews with BISS range personnel later identified those spheres as inert BLU-26 bomblets. These inert bomblets were examined by EOD and immediately cleared from the range (Dukes 1999).

4.3.6 Noise

Noise levels resulting from the construction and operation activities at Site C-3 would not exceed 85 dB for individuals located outside of the work area. Facility personnel and construction workers near and inside the construction area would be required to use hearing protection equipment, if the noise levels exceeded 85 dB over an eight-hour period. However, it is not projected that interior noise levels would exceed that level.

4.3.7 Air Quality

The alternative action would not have an adverse impact on air quality. Any emissions from trucks and heavy machinery used for excavation, pouring concrete, etc., would be minimal and temporary. Title V emission sources, such as oil tanks to fuel boilers, would not be added as part of the proposed action.

4.3.8 Land Use

The land use designation would not be impacted and would remain as an Industrial site. The facility would remain as an Electrical Research Radar Laboratory.

4.3.9 Mission Conflicts

Mission conflicts with the BISS operations at Site C-3, during which outdoor LADAR tests cannot be performed, would continue. In addition, the current LDERF facility is also located in the bomb-drop corridor for Range B-70. During such tests, which take place 4 to 5 times a year, the LDERF facility is evacuated for roughly 2 to 3 hours (Gorski 2003).

4.4 Effects of Alternative 4—Modify Bldg. 8777 and Establish Range, Site C-1

4.4.1 Biological Resources

Interior Modifications

The proposed interior modifications for Building 8777 would have no adverse impact on biological resources.

Construction of 2nd Floor Observation Room and Tower

The proposed construction of a 2nd floor observation room and tower would have no adverse impact on biological resources.

Establishment of a Northwest-Bearing Outdoor LADAR Range

The proposed action would involve clearing a 40-acre cone of trees in a forested area northwest of Building 8777, Site C-1 (Figure 8). This is a sparsely forested area consisting of sand pine, palmetto, and various lichens in the understory. Although the proposed action would eliminate a portion of habitat area for certain species, this action would not cause an adverse impact. The cleared area would not create large habitat fragments, and thus would not change the migration or feeding patterns of animal species in the area. The cleared area may attract more deer to graze. However, this area is banned from hunting, which would mitigate the decrease in cover for the deer moving through the cleared area.

Sand pine and long leaf pine in this area would be classified as merchantable timber. Tree removal will require consultation and approval from Mr. Scott Hassel at Jackson Guard, AAC/EMSN, before any trees are cut and removed. (Ironside 2000).

The proposed action would cause no adverse impacts to threatened and endangered species. This area is not considered a suitable RCW foraging area, due to the predominance of sand pine and lack of longleaf pine trees 30 years and older. The closest marked RCW trees (inactive) are 1.5 and 1.7 miles northwest of Building 8777 (Figure 13). These inactive RCW trees are located 0.5 and 0.7 miles, respectively, north of the headwaters of Long Creek. However, due to the distance from the facility and the inactivity of the sites, the proposed establishment of a LADAR test range would have no adverse impact on the RCW.

No gopher tortoise burrows were found on the site, but if tortoise burrows were detected in the future, Jackson Guard (AAC/EMSN) would be notified immediately. Okaloosa Darters can be found in the headwaters of Long Creek, located approximately 800-1000 meters north of the northernmost edge of the range perimeter. Due to the distance from the stream and relatively flat slope of the area, Jackson Guard determined that the establishment of the range would have no adverse effect on the Okaloosa Darter (Ironside 1999).

4.4.2 Water Resources

Interior Modifications

The proposed interior modifications for Building 8777 would have no adverse impact on water resources (surface waters, ground water, and wetlands). Since the current footprint of Building 8777 would remain the same, there will be no creation of additional impervious surfaces. Due to the small number of personnel relocating to this building, consumptive water usage would not exceed past usage. In addition, the current septic system is adequate for future usage.

Construction of 2nd Floor Observation Room and Tower

The proposed construction of a 2nd floor observation room and tower would have no adverse impact on water resources.

Establishment of a Northwest-Bearing Outdoor LADAR Range

The establishment of an outdoor LADAR test range would not have an adverse impact on water resources, including surface waters, ground water, and wetlands. Nor would the location of the LADAR test range make it susceptible to 100-year flood events. According to FEMA 100-year floodplain maps, the proposed LADAR test range would not be susceptible to such flooding events (Bristol 1999). Eglin GIS 5-foot contour maps corroborated these data by showing the elevation of the proposed LADAR test range to be approximately 45 feet above the elevation of Long Creek. In addition, the northernmost tip of the range cone is between 800 and 1,000 meters south of the creek. Thus, considering the steep slope upward from the creek and distance from the creek to the test range, there are no floodplain concerns associated with the proposed action.

Narrow riparian wetlands consisting of titi, smilax, and sweet bay exist along the banks of Long Creek. The narrowness is due to the immediate steep increase in slope from the creek bank. The proposed establishment of a LADAR test range would not intersect any jurisdictional wetlands. Thus, acquiring an Army Corps of Engineers Section 404 Dredge and Fill permit would not be necessary (Robeen 1999).

As mentioned in Section 4.3.1, Biological Resources, the endangered Okaloosa Darter can be found in the headwaters of Long Creek. One concern with the establishment of the LADAR test range was how disruption of range soil could cause sheet erosion that could flow down slope to Long Creek. This sediment load would increase turbidity and compromise the integrity of the stream, thus posing an adverse impact to the Okaloosa Darter. In order to prevent possible negative or deleterious effects to the Okaloosa Darter, management measures are proposed in Chapter 5, Conclusion, Management Requirements, and Permits.

4.4.3 Hazardous Materials/Hazardous Waste

Interior Modifications

There is currently no plan as to what level the building would be modified or renovated. Non-friable asbestos has been detected in floor tiles throughout the building and around pipes in the ceiling above the boiler room. Although it is currently unused, this building has been noted to be in very good condition. However, new flooring may need to be installed. Should any renovation require the removal of ACM or LBP, all abatement and disposal would be conducted in accordance with the 2002 *Eglin AFB Asbestos Management Plan*, AAC Plan 32-3. The proposed action would not have an adverse impact on hazardous materials/hazardous waste. Thus, by following proper abatement and disposal procedures, there should be no adverse impacts to human health or the environment.

Construction of 2nd Floor Observation Room and Tower

The proposed construction of a 2nd floor observation room and tower would not adversely impact hazardous materials/hazardous waste at Site C-1.

Establishment of a Northwest-Bearing Outdoor LADAR Range

The proposed establishment of an outdoor LADAR test range would not adversely impact hazardous materials and hazardous waste. An IRP site does exist roughly 30 meters north of the fence surrounding Building 8777. Site number ST-258 is a water tower that supplies water to the surrounding area. IRP records indicate that the soil around the water tower had been contaminated with LBP chips that had fallen from the tower. The IRP action plan for this site included excavating the soil and then replacing the excavated soil with clean fill. This site was completed, a formal record of decision (ROD) was issued, and the site was officially closed. Full remediation of the site was completed in April of 2002 (Armstrong 2003). There were no safety/ occupational health threats to personnel by the existence of the IRP site due to its extremely localized contamination and location outside the proposed activity area. This alternative would not introduce new hazardous materials to the site, except for a woody herbicide

like Garlon 4 that could be used to treat woody emergent growth. This herbicide could potentially be used as an alternative to mechanical cutting/maintenance of emergent vegetation.

4.4.4 Cultural Resources

Interior Modifications

Interior modifications of Building 8777 would have no effect on cultural resources.

Construction of 2nd Floor Observation Room and Tower

Construction of an observation room and tower would have no effect on cultural resources.

Establishment of a Northwest-Bearing Outdoor LADAR Range

Although high probability zones for cultural resources exist in the vicinity of Site C-1, range clearing would occur in an area of low probability of detection of cultural resources. EMH personnel conducted a pedestrian survey of the area and no historic properties or artifacts were located. The establishment of an outdoor LADAR test range would have no adverse impacts on cultural resources.

4.4.5 Safety/Occupational Health

Interior Modifications

All safety and occupational health concerns relating to the exposure to and handling of ACM and LBP are described in Section 4.4.3, Hazardous Materials/Hazardous Wastes. Otherwise, the proposed action to modify the interior of Building 8777 should have no adverse impact on safety and occupational health.

Construction of 2nd Floor Observation Room and Tower

The proposed action of constructing a 2nd floor observation room and tower should have no adverse impact on safety and occupational health.

Establishment of a Northwest-Bearing Outdoor LADAR Range

The establishment of an outdoor LADAR testing range at Site C-1 should not have an adverse impact on safety and occupational health providing certain precautions are taken.

The area of Site C-1, given its close proximity to the C-52 test complex, is considered to be a high probability area for the existence of surface and subsurface UXO. Figure 19 indicates areas around TA C-52 that are considered a high probability area for UXO. Although Site C-1 has been designated as an area with probable UXO contamination, the extent of that contamination has not been determined. Thus, the Eglin AFB Range Safety office, AAC/SEU, would require the Air Force EOD group to perform a thorough ground sweep of the area for the proposed

LADAR test range. If a large amount of UXO is detected on site, establishment of an outdoor range may be unfeasible. However, if the range was not heavily contaminated and declared safe by EOD, range clearing would be allowed to commence. A more detailed discussion of UXO detection, disposal, and removal is discussed in Section 4.2.5.

4.4.6 Noise

Interior Modifications

Interior modifications to Building 8777 would not generate noise levels exceeding 85 dB. Facility personnel and construction workers inside the work area would be required to use hearing protection equipment in accordance with OSHA regulations if the noise levels exceeded 85 dB over an eight-hour period. However, it is not projected that interior noise levels would exceed that level. Noise impacts to indoor LDERF operations from activities that take place at Test Area C-52 will be discussed below, under *Establishment of an Outdoor LADAR Test Range*.

Construction of 2nd Floor Observation Room and Tower

The construction of a 2nd floor observation room and tower would not create any adverse noise impacts. Noise impacts to 2nd floor operations from activities taking place at Test Area C-52 will be discussed below, under *Establishment of an Outdoor LADAR Test Range*.

Establishment of a Northwest-Bearing Outdoor LADAR Range

Although the proposed clearing of trees and outdoor LADAR testing at Site C-1 should not generate noise levels exceeding 85 dB, activities on TA C-52 (i.e., EOD operations) could cause noise levels at Site C-1 that exceeded 85 dB. The Army accepts a threshold of 115 dBP as the level at which there is a moderate risk of noise complaints (U.S. Air Force 1995). Below the 115 threshold, there is almost no evidence of complaints or community action (U.S. Air Force 1999). The 140-dBP threshold is the level that above which, negative effects to biological organisms would occur.

The Navy and CE EOD detonate many items on C-52N and C-52W. All individual items detonated at both C-52N and C-52W through 1999 was below 1,000 lbs NEW (U.S. Air Force 1999). The amount of explosive material detonated by the Navy EOD School and CE EOD would be below the threshold level for annoyance. Thus, the Site C-1 LDERF would be exposed to noise levels below the threshold of annoyance. Noise resulting from the Navy and CE EOD activities could potentially cause negative effects if detonations are performed during unfavorable weather conditions (i.e., inversions and/or high winds), but detonations under such conditions are usually avoided (U.S. Air Force 1999). If 2,500 lb bombs were dropped at C-52W, the C-1 LDERF site would have to be evacuated (Figure 21) given the exposure of the site to decibel levels above 140.

4.4.7 Air Quality

Interior Modifications

Modifications to Building 8777 would not cause any adverse impacts to ambient air quality. The proposed action would not create any new additional Title V emissions sources. Building operations would continue to utilize the two, 1,000-gallon diesel tanks that fuel boilers for hot water and comfort heating. The two above ground diesel tanks fuel two external combustible boilers with a combined 1,000,000 British Thermal Units per hour (BTU/hr) capacity. Both the tanks and boilers are fully operational and have current AQUIS designations. It is estimated that these boilers would operate for five months out of the year (November through March) and would operate for approximately 150 hours per month. This is estimated to be 35% of the operational capacity (Benison 1999). Emissions from the operations of these boilers were estimated and are compared to Okaloosa County's boiler operations per year. Data in Table 4.1 indicate that the emissions from the boilers at Building 8777 are minimal when compared to the Okaloosa County emissions rates. These rates are well below the 10% unregulated limit for total emissions in a given area set by USEPA.

Since ACQR 5 is such a large air quality region, air emissions in the affected environment are only compared to emissions in Okaloosa County. Although ambient air quality standards are comprised of six pollutants, local data are only available for the following reactive and inert pollutants: sulfur oxides (SO_x), particulate matter with a diameter less than or equal to 10 microns (PM₁₀), carbon monoxide (CO), ozone (O₃), nitrogen oxides (NO_x), and lead (Pb) (Eglin AFB 1999). The Okaloosa County data provided below is taken from the Okaloosa County Emissions inventory. The combustive emissions were estimated using USEPA-approved emissions factors for the operations of commercial boilers (USEPA 1995). According to Table 4.1 below, the external combustion sources at Building 8777 would produce a negligible amount of emissions compared to emissions produced by Okaloosa County. Thus, the continued operation of boilers in Building 8777 would not have an adverse impact on air quality (U.S. Air Force 2001a).

Table 4.1. Total Emissions for Building 8777 Dual Boiler Operation (tons/year)

Pollutant Emission Source	CO	NO_x	PM₁₀	SO_x	VOCs
Building 8777	0.0179	0.0716	0.0041	0.2061	0.0012
Okaloosa Co.	91,361	8,709	3,930	406	11,958
Total Emissions					
% Change	0.00%	0.00%	0.00%	0.05%	0.00%

Source: U.S. Air Force, 2001a

If the proposed action were implemented, there would be additional Title V reporting requirements for AFRL/MN. The ownership of the four AQUIS sites at Site C-1 (two diesel

tanks and two boilers) would be transferred from the 46 TW to AFRL/MN. Thus, the lab would report emissions from these sites in the Eglin AFB Monthly Air Monitoring Report.

Construction of 2nd Floor Observation Room and Tower

Construction of a 2nd floor observation room and tower would not cause any adverse impacts to ambient air quality. The proposed action would not create any new additional Title V emissions sources.

Establishment of a Northwest-Bearing Outdoor LADAR Range

The establishment of an outdoor LADAR test range would not cause any adverse impacts to ambient air quality. The proposed action would not create any additional Title V emissions sources.

4.4.8 Land Use

Interior Modifications

No impacts to land use are anticipated, since the area would remain designated as Industrial, and the current building use designation, Electrical Radar Research Laboratory, would remain the same.

Construction of 2nd Floor Observation Room and Tower

No impacts to land use are anticipated, since the area would remain Industrial, and the current building use designation, Electrical Radar Research Laboratory, would remain the same.

Establishment of a Northwest-Bearing Outdoor LADAR Range

The proposed action involves converting an undeveloped, but disturbed sand-pine forest to a designated test range. However, the land use would not change, since the area around Site C-1 was designated as industrial (Sanchez 1999).

4.4.9 Mission Conflicts

Site C-1 exists roughly 2 miles from the southern tip of C-52W and 3.5 miles from the center of C-52 N. There is a potential for footprints of certain tests to include the location of Site C-1. Although the potential for mission conflicts with TA C-52 exists, historically there have been few site evacuations per year at Site C-1 (Miller 2000). When Site C-1 functioned as a Chemical/Biological laboratory and later as a Radar Laboratory, there were no more than 1 to 2 mission conflicts per year. During a TA C-52 mission, where Site C-1 would be located in the footprint, personnel were usually asked to remain indoors, or had to evacuate the building. When evacuations were necessary, the time away from site C-1 lasted between 1.5 to 2 hours (Miller 2000).

According to 46 OSS, the 46 TW Range Scheduling office, the footprint for Mk-82s used in the Navy COM2EX and JTFEX training would likely overlap Site C-1. Since the Navy may start conducting such tests more regularly at Eglin AFB as a substitution to bombing ranges at Vieques, Puerto Rico, evacuations could increase by two events per year (spring and fall) (Miller 2000). Thus, normal C-52 activities plus the increased U.S. Navy mission would most likely result in roughly 4 scheduling conflicts that could result in a Site C-1 evacuation.

4.5 Effects of Alternative 5—Modify Building 8777, Construct Indoor Laser Range, and Establish Outdoor Range, Site C-1

4.5.1 Biological Resources

Interior Modifications

The proposed interior modifications for Building 8777 would have no adverse impact on biological resources.

Construction of an Indoor LADAR Range

The proposed construction of a 2,400-ft² indoor LADAR range adjacent to Building 8777 would have no adverse impact on biological resources. The building will be constructed on an existing impervious surface directly north of the building, and will exist in an enclosed area.

Establishment of a Northeast-Bearing Outdoor LADAR Range

The proposed action would involve clearing a 72-acre cone of trees in a forested area bearing northeast from Building 8777 (Figure 10). Unlike the forested area bearing northwest, the proposed northeast-bearing range contains a denser understory, new-growth oak stands, and several clusters of longleaf pine. During a 23 March 2000 site visit, both new-growth and old growth longleaf pine clusters were found in the area marked for the northeast-bearing range. Most of the longleaf pine clusters were located east of Range Road 214. The greater incidence of longleaf pine east of Range Road 214 can be directly correlated to past-prescribed burning measures that took place on that portion of the range (Ironside 2000). Although there are no RCW sites in the longleaf pine clusters and the area is not considered to be an active RCW foraging area, eliminating the longleaf pine could potentially eliminate a future RCW nesting and foraging area.

Although Alternative 5 consists of clear-cutting clusters of longleaf pine trees, this action should not cause an adverse impact to biological resources. The cleared area could potentially change the feeding patterns of animals located in and around the proposed range. However, the effects of the creation of this habitat fragment on wildlife in the area are unknown. As with the northwest-bearing range, the cleared area may attract more deer and other wildlife to graze. This area is off-limits to hunting, which would mitigate the decrease in cover for the wildlife moving through the cleared area.

The longleaf and sand pine would be classified as merchantable timber; thus the sale of the clear-cut lumber would generate revenue for the base. Tree removal would require consultation and approval from Mr. Scott Hassel at Jackson Guard, AAC/EMSN, before any trees are cut and removed. A contractor would pay Jackson Guard to clear sand pine and longleaf pine, which would be removed by selective clear cutting. The contractor would only remove the usable, merchantable timber. Either Civil Engineering or a contractor would perform the clearing of the woody (live oaks) and herbaceous understory (Ironside 2000).

The proposed action would not cause adverse impacts to threatened and endangered species. As mentioned previously, although this area is not currently considered to be RCW foraging area, eliminating the clusters of both new growth and old-growth longleaf pine essentially eliminates a future foraging and nesting area. The closest marked RCW trees (inactive) are 1.5 and 1.7 miles northwest of Building 8777. These inactive RCW trees are located 0.5 and 0.7 miles, respectively, north of the headwaters of Long Creek.

No gopher tortoise burrows were found on the range during the 23 March 2000 site visit, but if tortoise burrows were detected in the future, Jackson Guard (AAC/EMSN) would be notified immediately. Okaloosa Darters can be found in the headwaters of Long Creek, located approximately 400 meters north of the northernmost edge of the range perimeter. Unlike the northwest-bearing range, the border of this range is much closer to the steep ravine area that slopes to the creek. The closer distance increases the risk that range activities could negatively impact the Darter stream. However, certain measures will be taken to ensure that the establishment of the range will not adversely affect the Darter stream. These measures are included in Chapter 5, Conclusion, Management Requirements, and Permits.

4.5.2 Water Resources

Interior Modifications

The proposed interior modifications for Building 8777 would have no adverse impact on water resources (surface waters, ground water, and wetlands). Since the current footprint of Building 8777 would remain the same, there will be no creation of additional impervious surfaces. Due to the small number of personnel relocating to this building, consumptive water usage would not exceed past usage. In addition, the current septic system is adequate for future usage.

Construction of an Indoor LADAR Range

The proposed construction of a 2,400-ft² indoor LADAR range adjacent to Building 8777 would have no adverse impact on water resources. The building will be constructed on an area where impervious surface exists, so there would be no new net creation of impervious surface. This area is directly north of the building, and will exist in an enclosed area. Thus, this action would have no adverse impact on water resources. The construction of a storm water treatment system for the indoor LADAR laboratory would not be necessary (Robeen 2000).

Establishment of a Northeast-Bearing Outdoor LADAR Range

The establishment of an outdoor LADAR test range would not have an adverse impact on water resources, including surface waters, ground water, and wetlands. Nor would the location of the LADAR test range make it susceptible to 100-year flood events. According to FEMA 100-year floodplain maps, the proposed LADAR test range would not be susceptible to such flooding events (Bristol 1999). Eglin GIS 5-foot contour maps corroborated these data by showing the elevation of the proposed LADAR test range to be approximately 45 feet above the elevation of Long Creek. Unlike the northwest-bearing range, the northernmost tip of the northeast-bearing range cone is roughly 400 meters south of the creek. Although there is less distance between this range and the creek, the steep slope upward from the creek would eliminate floodplain concerns associated with this action.

Narrow riparian wetlands consisting of titi, smilax, and sweet bay exist along the banks of Long Creek. The establishment of a northeast-bearing range would not intersect any jurisdictional wetlands. Thus, acquiring an Army Corps of Engineers Section 404 Dredge and Fill permit would not be necessary (Robeen 1999).

A common concern for the establishment of both northeast and northwest ranges is how the disruption of range soil could cause sediment loading into Long Creek. The possibility of sediment loading could increase turbidity and compromise the integrity of the stream, thus posing an adverse impact to the Okaloosa Darter. To prevent possible negative or deleterious effects to the Okaloosa Darter, management measures are proposed in Chapter 5, Conclusion, Management Requirements, and Permits.

4.5.3 Hazardous Materials/Hazardous Waste

Interior Modifications

There would be no adverse impacts on hazardous materials/waste due to this alternative. Issues would be the same as discussed under Section 4.4.3, Hazardous Materials/Hazardous Waste.

Construction of an Indoor LADAR Range

The construction of an indoor LADAR range would have no adverse effect on hazardous materials/waste. ACM and LBP would not be utilized in the construction of this building.

Establishment of a Northeast-Bearing Outdoor LADAR Range

The establishment of an outdoor LADAR range would have no adverse effect on hazardous materials/waste. Although an old chemical/biological landfill exists in the vicinity of Site C-1, IRP records have determined that the landfill cleanup has been closed out and that no further action is required for this location (Armstrong 2000). This alternative would not introduce new hazardous materials to the site, except for a woody herbicide like Garlon 4 that could be used to treat woody emergent growth. This herbicide could potentially be used as an alternative to mechanical cutting/maintenance of emergent vegetation.

4.5.4 Cultural Resources

Interior Modifications

Interior modifications of Building 8777 would have no effect on cultural resources.

Construction of an Indoor LADAR Range

Construction of an indoor LADAR range north of Building 8777 would have no effect on cultural resources.

Establishment of a Northeast-Bearing Outdoor LADAR Range

Although high probability areas for cultural resources exist in the vicinity of Site C-1, range clearing would occur in an area of low probability of detection of cultural resources. EMH personnel conducted a pedestrian survey of the area on 23 March 2000, and no historic properties were located. Two Pringle cups, clay cups used in the turpentine industry, were found on the area set aside for the northeast bearing range. No other artifacts were observed. The establishment of an outdoor LADAR test range would have no adverse impacts on cultural resources (Pugh 2000).

4.5.5 Safety/Occupational Health

Interior Modifications

All safety and occupational health concerns relating to the exposure to and handling of ACM and LBP are described in Section 4.4.3, Hazardous Materials/Hazardous Wastes. Otherwise, the proposed action to modify the interior of Building 8777 should have no adverse impact on safety and occupational health.

Construction of an Indoor LADAR Range

The proposed construction of an indoor LADAR range north of Building 8777 would have no adverse impacts on safety and occupational health.

Establishment of a Northeast-Bearing Outdoor LADAR Range

Safety and occupational health issues involving the establishment of this range are the same as for the northwest bearing range. Discussion of these issues is found in Section 4.4.5, Safety/Occupational Health. The only difference between the two alternatives would be the cost of providing a UXO sweep for 72 acres.

4.5.6 Noise

Interior Modifications

Interior modifications to Building 8777 would not generate noise levels exceeding 85 dB. Facility personnel and construction workers inside the work area would be required to use hearing protection equipment in accordance with OSHA regulations, if the noise levels exceeded 85 dB over an eight-hour period. However, it is not projected that interior noise levels would exceed that level. Noise impacts to indoor LDERF operations from activities that take place at Test Area C-52 are discussed below.

Construction of an Indoor LADAR Range

The construction of an indoor LADAR range would not create any adverse noise levels exceeding 85 dB. As described above, facility and construction personnel would be required to wear proper hearing protection equipment if noise levels exceeded 85 dB.

Establishment of a Northeast-Bearing Outdoor LADAR Range

Noise thresholds at C-52 W and C-52 N, which result in noise levels below 115 dBP, are 2,500 lbs. NEW and 3,000 lbs. NEW, respectively. LDERF operations at Site C-1 could be exposed to noise at or above the 140-dBP threshold for harm to biological organisms if 2,500 lbs. NEW were detonated at C-52 W. Through 1999, all individual items detonated at both C-52 N and C-52 W was below 1,000 pounds net explosive weight (NEW) (U.S. Air Force 1999). The amount of explosive material detonated by the Navy EOD School and CE EOD were below the 115-dBP-threshold level for annoyance.

Personnel at Site C-1 would be exposed to noise levels of between 115 and 120 dBP when MK-83s (445 lbs. NEW) are detonated under normal weather conditions. However, personnel could be exposed to higher noise levels of at least 130 dBP when MK-83s are dropped on TA C-52 (U.S. Air Force 1999). Thus, although LADAR personnel could be exposed to noise levels at or above the 140-dBP threshold, data compiled for the TA C-52 PEA demonstrated that past explosive detonations were below the 115-dBP threshold for annoyance (U.S. Air Force 1999).

4.5.7 Air Quality

Interior Modifications

Modifications to Building 8777 would not cause any adverse impacts to air quality. Issues for this alternative would be the same as discussed under Section 4.4.7, Air Quality.

Construction of an Indoor LADAR Range

Construction of an indoor LADAR range would not cause any adverse impacts to ambient air quality. Fugitive dust would probably be created due to construction activities, but this effect would be temporary. Construction workers and site personnel would be required to use personal

protective equipment to guard against the inhalation of dust and other particulate matter. The proposed action would not create any additional Title V emissions sources.

Establishment of a Northeast-Bearing Outdoor LADAR Range

The establishment of an outdoor LADAR test range would not cause any adverse impacts to ambient air quality. Fugitive dust would probably be created due to construction activities, but this effect would be temporary. Construction workers and site personnel would be required to use personal protective equipment to guard against the inhalation of dust and other particulate matter. The proposed action would not create any additional Title V emissions sources.

4.5.8 Land Use

Interior Modifications

No impacts to land use are anticipated, since the area would remain Industrial, and the current building use designation, Electrical Radar Research Laboratory, would remain the same.

No impacts to land use are anticipated, since the area would remain designated as Industrial, and the current building use designation, Electrical Radar Research Laboratory, would remain the same.

Establishment of a Northeast-Bearing Outdoor LADAR Range

The proposed action involves converting an undeveloped, but disturbed sand-pine forest to a designated test range. However, the land use would not change, since the area around Site C-1 was designated as industrial (Sanchez 1999).

4.5.9 Mission Conflicts

Mission conflict issues for this alternative would be the same as discussed under Section 4.4.9, Mission Conflicts.

5.0 CONCLUSION, MANAGEMENT REQUIREMENTS, AND PERMITS

5.1 CONCLUSION

Based on the information collected and analyzed for this Environmental Assessment, there would be no known adverse environmental impacts due to the construction of an LDERF and the establishment of an outdoor LADAR test range west of TA C-53.

5.2 MANAGEMENT REQUIREMENTS

Biological Resources

To further ensure that the establishment of a LADAR test range would not adversely impact the Okaloosa darter, stumps of clear-cut trees would not be removed. By cutting trees flush to the ground and not digging up stumps, the likelihood of loosened soil moving down slope via sheet flow to Turkey Bolton and Long Creeks would be greatly minimized. Furthermore, any disturbed areas would be seeded with grass or vegetated by some other means to anchor the soil. Also, the planting effort would be maintained to prevent further erosion from occurring. This area may be treated with a herbicide to prevent the propagation of noxious weeds.

Water Resources

Instead of conducting a clear cut of trees and subsequent removal of stumps, trees will only be cut flush to the ground. This would prevent disturbed, unanchored soil from being susceptible to overland sheet flow during rain events. In addition, if erosion becomes noticeable on the range, vegetation such as native grasses would be planted. These measures should prevent any adverse impacts to surface waters and narrow riparian wetland areas located along Turkey Bolton and Long Creeks.

Since a new site will be constructed and new impervious surface would be created, storm water management structures must be constructed to prevent storm water runoff from intercepting receiving waters. To prevent this from happening, swales will be constructed around the access road, building, parking lot, and concrete pad. The swales will be built to satisfy physical and functional requirements outlined in 62-25, FAC. Construction best management practices will be used to keep soil in the disturbed construction zone from impacting receiving waters.

Construction of a new facility will result in new water consumption requirements for this area. The new LDERF will require a well for water consumption, fire suppression, and septic system support. Establishment of a well to draw potable water from the Floridan Aquifer would require a consumptive use permit. This permit would regulate how much water could be pumped from the well per day.

Safety/Occupational Health

Two requirements for the outdoor LADAR range is the need for a clear line of sight to test lasers and for a flat range surface to allow for vehicles access to move targets along the length of the

range. Since tree stumps cannot be removed due to the potential to disturb subsurface UXO, other methods must be employed to ensure clear line of sight and suitable driving surface. An alternative would be to clear-cut trees flush to the ground. Stumps of pine trees typically do not sprout once cut. A suitable vegetation control could be to use either a bush hog or an herbicide to control any emergent vegetation.

An additional safety concern in the area west of TA C-53 is the hazard associated with testing lasers down range. The proposed action would not pose adverse impacts to safety. However, there is potential for mishaps to occur if certain safety precautions are not taken. Lasers would be fired from the LDERF research building to targets set at incremental distances along the range. Not only would laser testing be conducted during normal duty hours, but on evenings and weekends as well. In order to conduct outdoor laser testing in the area west of TA C-53, a Radiation Laser Safety OI would need to be written for the newly established range. The current OI would need to be re-written to include the requirements and specifications of the new range. In addition, the RSO offered the following measures to minimize inadvertent mishaps due to outdoor LADAR testing:

- Place flood lights at the far side of the range to sufficiently illuminate areas around targets
- Install red flashing lights that would be visible from any point on the range
- Place barbed-wire fencing around the test range (the chain-link fence is cost prohibitive, thus a rope fence will be established to mark the perimeter of the range)
- Place warning signs every 50 meters along the fencing indicating a laser hazard

If such measures were incorporated into the design of the test range, risks associated with exposure to lasers would be reduced. Also, as outlined in Chapter 4, Section 4.2.5, *Radiation Safety*, a large area will be closed to recreation to establish a safety footprint, since a chain link fence cannot be constructed due to cost. By restricting this area to all forms of recreation, the likelihood that hunters will be found in this area will be greatly minimized. Further safety controls outlined in Section 4.2.5 include range spotters, which would radio the LDERF control room to shut off the laser if someone were spotted near the range. New Jackson Guard maps would show that hunting was forbidden in this area (Ironsides 1999). Should hunters inadvertently encounter the range, warning lights and warning signs should alert them to the active/inactive status of the test range.

Noise

It is recommended that LDERF managers regularly consult with TA C-52 and TA C-53 range control personnel to schedule important LADAR testing events around C-52 and EOD ordnance detonation events. This would minimize the potential for LADAR personnel and instruments from being exposed to potential excessive noise levels should unfavorable meteorological conditions arise.

5.3 PLANS AND PERMITS

Plans:

Site Design Plan
Stormwater Pollution Prevention Plan

Permits Required:

General Permit for New Stormwater Discharge Facility Construction (per 62-25 FAC)
(This permit would only be required if the project is designed to meet swale exemption requirements)
Florida Permit for Stormwater Discharge from Construction Activities that Disturb One or More Acres of Land (62-621 FAC) (This permit would only be required if the construction area was greater than or equal to one acre)
Extension Permits for Electrical Utility Services Connection
Consumptive Use Permit
Permit for digging a well into the Floridan Aquifer

6.0 LIST OF PREPARERS

Tonya D. Savage, M.S.

Environmental Engineer, Air Force Research Laboratory Munitions Directorate

M.S. Environmental Engineering

B.S. Environmental Science

Years of Experience: 5.0

Area of Responsibility: Author

Steven M. Gorski, CAPT

Physicist, Air Force Research Laboratory

M.S. Physics

B.S. Physics

Years of Experience: 6.0

Area of Responsibility: GIS

7.0 LIST OF PERSONS CONTACTED

Armstrong, Ralph

Affiliation: Installation Restoration Program, AAC/EMR

Location: Eglin AFB, FL

Topic: Status of contaminated areas near Site C-1

Benison, Monica

Affiliation: Environmental Management Air Quality, AAC/EMCE

Location: Eglin AFB, FL

Topic: Boiler emissions for Site C-1

Bjorklund, Robin

Affiliation: Installation Restoration Program, AAC/EMR

Location: Eglin AFB, FL

Topic: depth to sand and gravel aquifer/groundwater information

Borthwick, Jesse

Affiliation: 46 TW Range Environmental Planning, 46 TW/XPE

Location: Eglin AFB, FL

Topic: Noise contours and FEMA floodplain maps

Brantley, Jeff

Affiliation: 46 TW Range Systems Flight Land Range Section, 46TW/TSRSL

Location: Eglin AFB, FL

Topic: Prices of EOD land sweeps for UXO

Brown, Russell

Affiliation: AAC/EMCE

Location: Eglin AFB, FL

Topic: storm water management structures, NPDES permits, swale exemptions

Carman, Christa

Affiliation: Installation Restoration Program, AAC/EMR

Location: Eglin AFB, FL

Topic: IRP sites for alternatives considered in EA

Dukes, Royce

Affiliation: Site manager, 46 TW BISS Facility, 46 TW/TSTM

Location: Eglin AFB, FL

Topic: inert bomblets found at Site C-3

Fortenberry, Harry
Affiliation: AFRL/MNMI
Location: Eglin AFB, FL
Topic: AFRL/MN hazardous materials/ hazardous waste management, hazardous materials kit process, AQUIS sources at AFRL/MN

Garrison, James
Affiliation: SAIC, Air Quality
Location: Fort Walton Beach, FL
Topic: Air emissions rates for boilers

Goplin, Bruce 1LT
Affiliation: Base Non-Ionizing/Ionizing Radiation Officer, 96 AMDS/SGPB
Location: Eglin AFB, FL
Topic: Radiation safety concerns at Site C-1

Gorski, Steven CAPT
Affiliation: Customer, AFRL/MNGS
Location: Eglin AFB, FL
Topic: LDERF mission activities, mission objectives, mission conflicts, and range specifications

Hassel, Scott
Affiliation: AAC/EMSN
Location: Natural Resources, Eglin AFB, FL
Topic: Ecological restoration sites and removing merchantable timber

Ironside, Kevin
Affiliation: Natural Resources, AAC/EMSN
Location: Eglin AFB, FL
Topic: Natural resources concerns at alternative sites, wetland concerns, endangered species concerns, hunting issues at Site C-1

Johnson, Justin
Affiliation: Jackson Guard, AAC/EMSN
Location: Eglin AFB, FL
Topic: recreation maps, closing recreational areas, safety footprints for operations

Kirksey, Larry
Affiliation: 96 AMDS/SGPB
Location: Eglin AFB, FL
Topic: ACM and LBP concerns at Site C-1

Miller, Donnie

Affiliation: 46TW Mission Scheduling Office, 46 OSS/TSTMC

Location: Eglin AFB, FL

Topic: Mission conflicts at Site C-1, general information about Site C-1

Miller, Robert

Affiliation: Jackson Guard, AAC/EMSN

Location: Eglin AFB, FL

Topic: Endangered species issues, RCW foraging area

Pugh, David

Affiliation: Cultural Resources, AAC/EMH

Location: Eglin AFB, FL

Topic: Cultural resources concerns at Site C-1

Rackard, Dennis

Affiliation: Civil Engineering Programming and Real Property, 96 CEG/CEPC

Location: Eglin AFB, FL

Topic: land use designations, specifications for a 2nd floor observation room, interior modifications for Building 8777, Site C-3 addition specifications, LADAR test ranges, utility usage rates, septic tanks, wells

Reina, Marisol

Affiliation: Environmental Impact Analysis Branch, AAC/EMSP

Location: Eglin AFB, FL

Topic: preparation of the EA, discussion of alternatives

Robeen, Daniel

Affiliation: Water Quality, AAC/EMCE

Location: Eglin AFB, FL

Topic: water quality issues at Sites C-3 and C-1

Sanchez, Mark

Affiliation: Civil Engineering Programming and Real Property, 96 CEG/CEPC

Location: Eglin AFB, FL

Topic: land use designations and site planning

Shreve, Lynn

Affiliation: Cultural Resources, AAC/EMSH

Location: Eglin AFB, FL

Topic: potential cultural resources issues in the area west of TA C-53

Singleton, Harold Lee SSGT

Affiliation: Air Force Explosive Ordnance Disposal, 96 CEG/CED

Location: Eglin AFB, FL

Topic: EOD range evaluations and removal of UXO

Smith, Brian CAPT

Affiliation: Previous Site manager LDERF facility, AFRL/MNGS

Location: Eglin AFB, FL

Topic: LDERF mission activities, mission objectives, mission conflicts, C-1 and C-3 range specifications

Steele, John

Affiliation: AAC/EMCE

Location: Eglin AFB, FL

Topic: Well use, consumptive use permits, septic tank setup

Swain, Tegan

Affiliation: Cultural Resources, AAC/EMH

Location: Eglin AFB, FL

Topic: Cultural resources concerns at Site C-3 and alternative sites eliminated from study

8.0 REFERENCES

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_____. 2001a. *Integrated Natural Resources Management Plan (INRMP)*. Department of the Air Force, Eglin Air Force Base, Florida.

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APPENDIX



Proposed LDERF Site from Range Road 200



Proposed LDERF Site Looking North to Range Road 200

*EA – AFRL/MN LADAR Research Laboratory
Construction and Establishment
of an Outdoor LADAR Test Range,
Eglin AFB, FL*

*RCS 99-162, 99-582, 03-375
13 August 2003*



View Down Range From Apex
of Cone

Vegetation on Range Looking
Southeast From Proposed
LDERF Site





View of Middle of LADAR Range Looking North



Alternate View of Range From Range Road 220 (Looking Northwest)

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Construction and Establishment
of an Outdoor LADAR Test Range,
Eglin AFB, FL*

*RCS 99-162, 99-582, 03-375
13 August 2003*



Southeastern Tip of LADAR Cone from Range Road 220



View of Range Road 406, Cutting through 2 km Range

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Eglin AFB, FL*

*RCS 99-162, 99-582, 03-375
13 August 2003*



View of Range from Range Road 406, Looking Northwest



View of Range from Range Road 406, Looking Northeast



Eastern-most Spray Field Southwest of Proposed Outdoor LADAR Range



Wetland East of Range Road 220 (Point J on Figure 16)



Close-up of Wetland East of Range Road 220 (Point J on Figure 16)



Ravine and Headwaters of Turkey Bolton Creek (Point G on Figure 16)



Typical Long Leaf Pine in the
Proposed LADAR Range Area

Sweet Bay Tree near Wetland
East of Range Road 220
(Point J on Figure 16)





View of the Front of Building 8777 from Range Road 218



View of the Back of Building 8777 from the North Fence line

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13 August 2003*



View of NW Corner of Building 8777, Proposed Site for Observation Tower



View from NW Corner of Building (Apex of NW LADAR Range, Alternative 3) or
Proposed Location of Indoor LADAR range (Alternative 4)

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Eglin AFB, FL*

*RCS 99-162, 99-582, 03-375
13 August 2003*



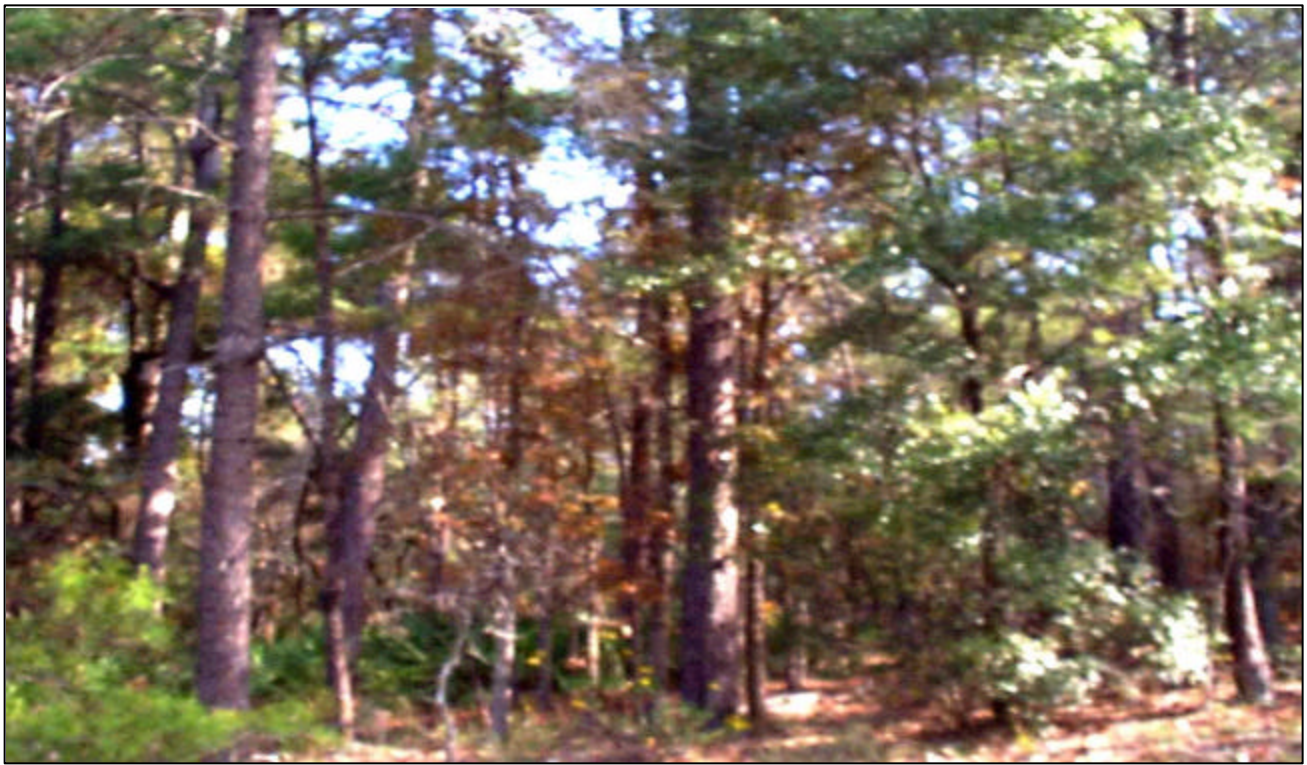
Facing Northwest from the Roof of Building 8777, Site C-1



Water Tower and Pump House facing Northeast from Building 8777, Site C-1

*EA – AFRL/MN LADAR Research Laboratory
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Forested Area to be Cleared for NW-bearing LADAR Test Range



Headwaters of Long Creek with Titi, Smilax, and Sweet Bay
(north of proposed LADAR range)

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Eglin AFB, FL*

*RCS 99-162, 99-582, 03-375
13 August 2003*



Forested Area on NE-bearing LADAR Range, Consisting of Sand Pine and Longleaf Pine, West of Range Road 214 (area not subjected to prescribed burns)

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Eglin AFB, FL*

*RCS 99-162, 99-582, 03-375
13 August 2003*



Old-Growth Longleaf Pine Cluster, East of Range Road 214



New-Growth Longleaf Pine Tree, One of Many Found East of Range Road 214

FINDING OF NO SIGNIFICANT IMPACT
FOR
AFRL/MN LADAR RESEARCH LABORATORY CONSTRUCTION AND
ESTABLISHMENT OF AN OUTDOOR TEST RANGE,
EGLIN AIR FORCE BASE, FLORIDA

RCS 99-162, 99-582, 03-375

Pursuant to the Council on Environmental Quality's regulations for implementing the procedural provisions of the National Environmental Policy Act (40 Code of Federal Regulations 1500-1508), Department of Defense Directive 6050.1, and 32 CFR 989 (Air Force Instruction 32-7061), the Department of the Air Force has conducted an Environmental Assessment (EA) of the probable environmental consequences for the construction of a LADAR research laboratory and establishment of an outdoor test range on Eglin Air Force Base (AFB), Florida.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

No Action Alternative:

The no action alternative would be to not transfer operations to Site C-1 or to construct an addition to Building 2067 at Site C-3. Safety issues and space constraints would remain.

Preferred Action Alternative:

The preferred action involves constructing a new 9,000 ft² LDERF (comprised of two buildings) in an undeveloped area currently used for recreation, which is west of TA C-53. The LDERF construction would create 25,270 ft² of impervious surface (building footprint, access road, parking lot, sidewalks, and concrete pad). The new buildings would contain an indoor LADAR range, laser characterization laboratories, office space, conference space, and storage space. The proposed action would also create a 117 acre LADAR test range, comprised of one, 1-km, 20-degree cone and one, 2-km, 10-degree cone.

Alternative 3:

This alternative involves constructing a 7,100-ft²-laser radar addition (area = 6,668 ft²) and observation tower (area = 432 ft²) adjacent to Building 2067, Site C-3, Auxiliary Field 2. The new laser radar building would consist of an indoor LADAR range, laboratories, office space, conference space, and storage space. An enclosed platform (tower room) on an adjacent 40-foot observation tower should facilitate all weather, outdoor testing and observation of laser radar seekers.

Alternative 4:

This alternative involves modifying the interior of Building 8777, Site C-1, to meet specifications for LADAR testing and to create office space for LADAR personnel. This

alternative also involves clearing a 40-acre, 15-degree cone-shaped range northwest of Building 8777, in order to establish an outdoor LADAR test range. This action would also involve constructing a small addition on the roof of the facility to allow for all-weather laser testing from an elevation other than ground level. A 40-ft. observation tower would also be constructed adjacent to the building.

Alternative 5:

This alternative involves reserving Site C-1 for potential transfer of its Laser Development and Evaluation Research Facility (LDERF) operations from Field 2 at Site C-3 to Building 8777 at Site C-1. The alternative also includes modifying the interior of the abandoned building to accommodate laser radar (LADAR) characterization laboratories, an indoor LADAR test areas, and office space for personnel. A 2,400-ft² indoor LADAR range will be constructed on the asphalt parking lot north of Building 8777. Finally, this alternative includes clearing approximately 72 acres of land in order to establish a northeast-bearing outdoor LADAR test range.

FINDING OF NO SIGNIFICANT IMPACT

After a review of the EA by the Air Armament Center, Environmental Impact Analysis Process Subcommittee, it has been concluded that the proposed construction of a LADAR research laboratory and establishment of an outdoor LADAR test range on Eglin AFB would not have a significant adverse impact of a long-term nature to the quality of the human or natural environment. Therefore, no Environmental Impact Statement will be prepared. This analysis fulfills the requirements of the National Environmental Policy Act, the President's Council on Environmental Quality and Air Force Instruction 32-7061.

25 Aug 03
DATE



JAMES D. SIRMANS, GM-15
Director, Environmental Management

MEMO

12 Aug 2003

FROM: AAC/EM-PAV

TO: EMSP

SUBJECT: PUBLIC NOTICE for the following Programmatic Environmental Assessment (PEA) and draft Finding of No Significant Impact (FONSI) on RCS 99-162, 99-582, and 03-375, AFRL/MN LADAR Research Laboratory Construction and Establishment of an Outdoor LADAR Test Range, Eglin AFB, Florida.

A public notice was published in the *Northwest Florida Daily News* on Jul. 25th, 2003 to disclose completion of the Draft EAs, selection of the preferred alternatives, and request comments during the 15-day pre-decisional comment period.

The 15-day comment period ended on Aug. 8th, with the comments required to this office not later than Aug. 11th, 2003.

No comments were received during this period.

//signed//

Mike Spaits

Environmental Public Affairs

FDNews; Date: 06/08/2003; Section: Local and State; Page:14
ActivePaper Edition

Eglin expanding area for weapons testing

By MLADEN RUDMAN

Daily News Staff Writer

EGLIN AFB — Eglin officials are closing roughly 3,300 acres of land previously open to outdoor recreation, including hunting with dogs, to accommodate more weapons testing.

The goal is to post the tracts off limits by Oct. 1, the beginning of the federal government's fiscal year.

However, land managers on the sprawling air base plan to reopen a notch over 1,900 acres on Management Unit 13B to hunting with dogs and other activities.

"This is 'mission comes first,' " said Mike Spaits, a spokesman for the Eglin environmental management branch, about the decision to cut back access.

He added that vast tracts of the range remain open to outdoors enthusiasts. For example, 181,000 acres of the reservation are still accessible to hunters with dogs and other types of hunting.

The largest closure — 2,576 acres — to outdoor recreation is in Walton County near Bull Pond, east of State Road 285 and northwest of Bob Sikes Road.

Also off SR 285, 785 acres in

the vicinity of Range C-53 in Okaloosa County will close to outdoor recreation. A contiguous parcel of 717 acres once accessible to hunters who use dogs to flush game such as white-tailed deer will be redesignated a stalking hunting-only area.

Among the expanding test mission needs on Eglin is construction of a new test facility.

An Air Force Research Laboratory Munitions Directorate Laser Detecting and Ranging outdoor range is planned for a swath of terrain just west of Range C-53.

A draft environmental assessment and finding of no significant impact was recently completed for the site. The armament center is accepting public comment through Tuesday on the proposal.

A timeframe for construction of the facility wasn't provided.

The document can be viewed at the Fort Walton Beach Library on Miracle Strip Parkway in downtown Fort Walton Beach and the Niceville Library off Partin Drive through Saturday.

To comment, contact Spaits at 882-2878, Ext. 333, or via facsimile at 882-3761. His e-mail address is spaitsm@eglin.af.mil